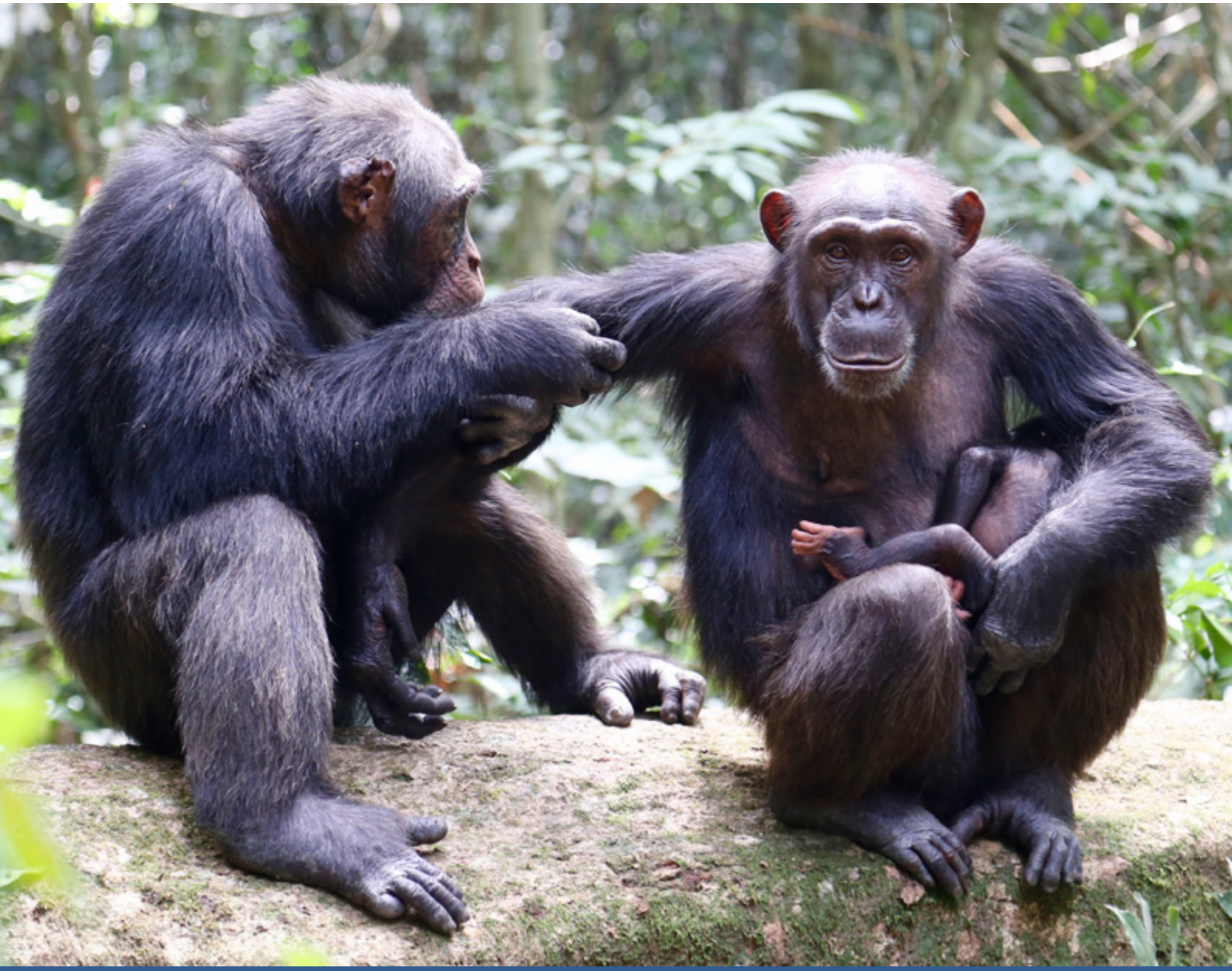
Regional action plan for the conservation of western chimpanzees (*Pan troglodytes verus*) 2020–2030

IUCN SSC Primate Specialist Group



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Compiled and edited by: Erin G. Wessling, Tatyana Humle, Stefanie Heinicke, Kimberley Hockings, Dirck Byler and Elizabeth A. Williamson

Contributors: Nana Kofi Adu-Nsiah, Bala Amarasekaran, Ibrahim Bakarr, Michael Balinga, Benjamin Barca, Elena Bersacola, Christophe Boesch, Ken Cameron, Genevieve Campbell, Frands Carlsen, Jim Desmond, Jenny Desmond, Mamadou Saliou Diallo, Issa Diarrasouba, Abdoulaye Diarrassouba, Mamady Dioumessy, Fai Djedjo, Aboa Dogui, Marc Fourrier, Benedictus Freeman, Joel Gamys, Jerry Garteh, Annemarie Goedmakers, Blamah Goll, Zoro Bertin Gone Bi, Weedor Gray, Barry Greville-Eyres, Annika Hillers, Jessica Junker, Namory Keita, Saiba Mamady Keita, Michelle Klailova, Alexandre Konate, Bashiru Koroma, Lisa Korte, Hjalmar Kühl, Kane Lamine, Matthieu Laurans, Menladi Lormi, Elizabeth Macfie, Oscar Maldonado, Sulay Mohammed, Mary Molokwu, David Momoh, Peter Mulbah, Nouhou Ndam, Papa Ibnou Ndiaye, Elenora Neugebauer, Liliana Pacheco, Maria Pascual, Kathryn Phillips, Helga Rainer, Johannes Refisch, Aissa Regalla, Tomás Saratscheff, Conrad Savy, Borwen Sayon, Silvana Sita, Tenekwetche Sop, Aly Gaspard Soumah, Doudou Sow, Paul Tehoda, Angelique Todd, Darlington Tuagben, Gregg Tully, Ansumana Babar Turay, Steve Unwin, Tina Vogt and Jim Wingard

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EXECUTIVE SUMMARY

In 2016, IUCN uplisted the western chimpanzee, *Pan troglodytes verus*, from "Endangered" to "Critically Endangered" (Humle *et al.* 2016a), reflecting the subspecies' increasingly dire conservation status. It occurs in Côte d'Ivoire, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Senegal and Sierra Leone, but has been extirpated in three countries – Benin, Burkina Faso and Togo. Of the four recognised chimpanzee subspecies, *Pan troglodytes verus* is under the greatest threat (Humle *et al.* 2016b). The population is estimated to have declined by 80% between 1990 and 2014, to approximately 52,800 individuals (Kühl *et al.* 2017; Heinicke *et al.* 2019a). The four chimpanzee subspecies have experienced an overall range reduction of 20% in just eight years, and much of this contraction can be linked to habitat loss, poaching and disease.

Over 10% of the western chimpanzee's current geographic range is habitat already earmarked for large-scale infrastructure development (Heinicke *et al.* 2019a), and this in addition to extensive overlap with land targeted for industrial extraction (Rainer & Lanjouw 2014), or suitable for agricultural plantations (Wich *et al.* 2014). Much of the population is unprotected, with only 17% of western chimpanzees residing in protected areas, leaving 83% under no formal protection. This subspecies occurs in a region with high human population growth, exposing it to potential conflicts of interest with both large- and small-scale developments. West Africa is anticipated to experience one of the world's highest rates of urban (Seto *et al.* 2012) and industrialised (Rainer & Lanjouw 2017) development. Rates of habitat loss are likely to escalate, as annual forest loss is predicted to reach 20% by 2030 and over 60% by the year 2050 (Palminteri *et al.* 2018). Already, nearly 40% of western chimpanzees live within 5 km of a human settlement and nearly 60% within 5 km of a road (Heinicke *et al.* 2019a). There is, therefore, a pressing need to mitigate, reduce or remove ongoing threats in the face of the clear pattern of chimpanzee losses, and to capitalise on conservation opportunities as they arise.

In light of this, western chimpanzees are on a trajectory towards extinction unless drastic measures are taken immediately. For this reason, a four-day workshop was convened in Monrovia, Liberia, to determine the actions needed to ensure the survival of western chimpanzees. Hosted by the Section on Great Apes of the IUCN SSC Primate Specialist Group (SGA), Flora & Fauna International (FFI) and the Forestry Development Authority of Liberia, the workshop brought together 62 stakeholders, including representatives of the governments of the western chimpanzee's eight range countries, conservation non-governmental organisations, civil society organisations, researchers and donor organisations. This document reports on the outcomes of the workshop and details a proposal for a path forward, providing a collective call for concrete action towards saving western chimpanzees.

The current plan presents the status and threats to *P. t. verus*, based on expert evaluation of the best scientific knowledge available to date. A considerable amount of new data has improved our knowledge of the distribution and status patterns of this subspecies since the first action plan was published in 2003 (Kormos *et al.* 2003a), and an analysis of the threats to chimpanzee populations highlights the need to address these threats and their drivers. Specifically, habitat loss and poaching were identified as the two highest threats to chimpanzees, followed by industrial and artisanal mining, disease, negative interactions between people and chimpanzees, industrial agriculture and road infrastructure development. Multiple indirect drivers also continue to threaten chimpanzees in the region. They include weak environmental governance (particularly lack of law enforcement and inadequate governance of industry), inconsistencies in legislation across countries, inadequate financial and logistical resources for chimpanzee conservation, and lack of consideration of chimpanzees in land-use planning.

This plan outlines actions, methods and indicators, and identifies implementers for the completion of the objectives given for each strategy, with the goal of achieving a collective vision:

Vision: A connected landscape where western chimpanzees and their habitats are valued, protected and thriving; ensuring mutually beneficial coexistence for current and future generations of chimpanzees and humans.

Stakeholders identified the following nine strategies, which encapsulate the efforts needed to conserve western chimpanzees across their geographic range:

1. **Defining norms and best practices:** *Defining norms and best practices for carrying out conservation activities should be rooted in the best available science. Conservation managers need access to the best techniques to implement programmes designed to counter the negative impacts of artisanal mining, human-wildlife relations, forestry, agriculture and other threats. This strategy presents recommendations to enable those working to conserve great apes to apply best practice to a range of high priority threats.*

2. **Eliminating research and data gaps:** *Accurate, comprehensive and up-to-date information on the status, distribution and population trends of the subspecies is required to guide effective conservation activities. This strategy highlights the actions needed for a better understanding of western chimpanzee distribution, to establish baselines*

of genetic and cultural diversity, measures to improve the effectiveness of conservation actions, and improve knowledge and understanding of the illegal chimpanzee trade.

3. **Developing policy and reviewing legal frameworks:** *Adequate legislation and policy are critical to law-enforcement efforts, ESIAs, proper regulation of the private sector and other activities that may negatively impact chimpanzees and their habitat. This strategy addresses critical steps in the review of legal texts, incoherencies among them, and existing gaps to provide recommendations for effective legal reform.*

4. **Setting up regional coordination mechanisms:** *Effective application of wildlife law requires adequate coordination among a range of international, national and local actors. This action plan highlights actions aimed at ensuring that authorities have a sufficient level of capacity to adequately enforce national laws, identify trafficking routes and coordinate international law enforcement operations. This section also emphasises the vital role that Pan African Sanctuary Alliance members and affiliated sanctuaries play in the application of wildlife law by facilitating confiscations, ensuring the proper placement and care of illegally-held and traded chimpanzees, and providing greater public awareness of the laws protecting chimpanzees and providing for their conservation.*

5. **Monitoring and managing disease outbreaks:** *This strategy describes a One Health approach to monitoring and managing disease outbreaks that can affect western chimpanzees. The premise of One Health is that people, wildlife and the environment form an interdependent ecosystem that needs to be considered in a holistic manner. Most western chimpanzees live in human-altered landscapes, and are hence vulnerable not only to emerging infectious diseases, but also at risk from pathogens of human origin. Such risks underlie the rationale for a One Health approach as well as disease surveillance to improve conservation management. One Health involves the collaborative efforts of multiple health science professionals, together with their related disciplines and institutions – working locally, nationally and globally – to attain optimal health for people, domestic animals, wildlife, plants and our environment.*

6. **Land-use planning:** *As chimpanzee habitat is lost to development and other land uses, integrated land-use planning (LUP) has become critical as it is ever harder to restore and repopulate affected areas, and negative interactions between people and chimpanzees are increasing. Until now, western chimpanzees have rarely been taken into account by planners, at either theoretical or practical levels. The overlap of chimpanzee range with proposed development corridors demonstrates the considerable potential costs to their populations; 10% of western chimpanzees live within 25 km of one of four proposed development corridors. This strategy highlights the critical value of LUP across different scales, with actions aimed at helping prevent or mitigate the impact of development and land conversion on chimpanzees through effective planning.*

7. **Maintaining, strengthening and establishing protected areas:** *Protected areas (PAs) are critical to the conservation of chimpanzees and their habitats. Despite the creation of several new national parks in recent years, currently only 17% of the population resides in PAs. Historically, PAs in West Africa have served largely as islands, buffering – with varying levels of success – biodiversity in general from habitat destruction. This strategy addresses the need to maintain, strengthen and enlarge PA networks for the conservation of chimpanzees and the rich and threatened wildlife and forests of West Africa, along with the critical ecosystems services they provide.*

8. **Raising awareness:** *Despite widespread international interest in chimpanzees, awareness of issues impacting their conservation is limited among several important stakeholder groups, including range country governments, local communities, industry, and border and customs agencies. This strategy presents actions for increasing awareness of chimpanzees as a protected species, the impacts of poaching and illegal trafficking, negative human-chimpanzee interactions, and the importance of maintaining the cultural and genetic diversity of the chimpanzees.*

9. **Financing conservation:** *This section reviews important mechanisms and streams for financing conservation efforts focused on the creation of conservation trusts, strengthening the harmonisation of long-term efforts to maximise the effective financing of chimpanzee conservation, including technical, logistical and financial support for range state environmental agencies and protected areas, as well as capacity building and professional development across various sectors, including higher education, in the western chimpanzee range countries.*

This action plan highlights how concerned stakeholders can harmonise their efforts, emphasising the critical role of regional coordination and inter- and multidisciplinary approaches in conserving the western chimpanzee. Finally, this plan also seeks to be dynamic, embedded in a monitoring and evaluation framework that will keep priorities and strategies relevant, updating objectives and information on threats as anthropogenic and ecological pressures evolve across West Africa.

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Development of this action plan was generously supported by the Great Apes Programme of the Arcus Foundation. Fauna & Flora International co-hosted the regional workshop in Monrovia, Liberia, which was funded by the Arcus Foundation, the Great Ape Conservation Fund of the United States Fish and Wildlife Service, and the USAID/West Africa Biodiversity and Climate Change Programme. Global Wildlife Conservation, the fiscal sponsor of the SGA, supported the graphic design of the action plan.

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Taï National Park from the air © WCF

ACRONYMS

A.P.E.S. – Ape Populations, Environments and Surveys

APS – African Primatological Society

ARRC – Avoidance, Reduction, Restoration and Compensation

ASM – artisanal and small-scale mining

CCC – Chimpanzee Conservation Center

CDC – Centre for Disease Control and Prevention

CITES – Convention on International Trade in Endangered Species of Wild Fauna & Flora

CPSG – Conservation Planning Specialist Group

CSO – civil society organisation

CSRS – Centre Suisse de Recherches Scientifiques

DRA – disease risk analysis

EAGLE – Eco Activists for Governance and Law Enforcement

ESIA – environmental and social impact assessment

EVD – Ebola virus disease

FFI – Flora & Fauna International

GRASP – Great Apes Survival Partnership

IUCN – International Union for Conservation of Nature

IFC – International Finance Corporation

KfW – Kreditanstalt für Wiederaufbau

LCRP – Liberia Chimpanzee Rescue and Protection

LUP – land-use plan/planning

MPI – Max Planck Institute for Evolutionary Anthropology

NEA – national environmental agency

NGO – non-governmental organisation

PA – protected area

PAA – protected area authority

PASA – Pan African Sanctuary Alliance

PanAf – Pan African Programme (MPI)

SEA – strategic environmental assessment

SCP – systematic conservation plan/planning

SGA – Section on Great Apes (of the IUCN SSC Primate Specialist Group)

SSC – Species Survival Commission

TCP – Taï Chimpanzee Project

USAID – USAID United States Agency for International Development

USFWS – United States Fish and Wildlife Service

WA-BiCC – West African Biodiversity and Climate Change Program

WCF – Wild Chimpanzee Foundation

WHO – World Health Organization

Young chimpanzees, Taï National Park, Côte d'Ivoire © Liran Samuni/TCP

SECTION 1. INTRODUCTION

The geographic range of western chimpanzees, *Pan troglodytes verus* Schwarz, 1934, spans eight West African countries and a diverse array of habitats, from the tropical humid forests along the coast to the montane regions of Nimba and Lofa, north to the undulating highlands of the Fouta-Djallon, and the savanna mosaic that touches the Sudano Sahel. Humans and chimpanzees have coexisted in this region for thousands of years. While the human population has exploded in size in recent years, the chimpanzee population has declined precipitously, and been extirpated through a large part of its former range. In the past two decades, the number of chimpanzees in West Africa has declined by 80% – a trajectory that will continue unless concerted action backed by local, national and international support is taken immediately.

A stakeholder workshop took place over four days in Monrovia, Liberia, in December 2017, hosted by the Section on Great Apes of the IUCN SSC Primate Specialist Group (SGA), Flora & Fauna International (FFI) and the Forestry Development Authority of Liberia. Sixty-two participants, including representatives from governmental departments in the eight countries of the western chimpanzee's range, conservation non-governmental organisations (NGOs), civil society organisations (CSOs), researchers and donor organisations, worked together to determine the actions needed to ensure the survival of western chimpanzees.

The methodology used to create this action plan was an adaptation of the Open Standards (http://cmp-openstandards.org/) conservation-action-planning approach (OS). This method involves identifying conservation priorities ('Conservation Targets') in a precise geographic area ('Scope of the Project'), then assessing the target's viability, and identifying threats to the targets. An assessment of the important stakeholders and the political and environmental context in which this action plan will be implemented was also undertaken. These analyses then led to the development of conservation strategies with precise, concrete and measurable objectives, as well as an implementation and monitoring plan.

Conservation targets were defined by a technical committee in advance of the workshop (Table 1). Participants at the workshop grouped conservation targets, defined the threats, and created conceptual models for each. The actions listed in the conceptual models were then grouped according to theme, to become region-wide strategies (see Section 3).

Workshop results were synthesised in a post-workshop meeting to reduce redundancy and merge them into a single outline from which a cohesive plan could be created. In its synthesis, the resulting plan deviates from standard OS methodology in that it broadens the conservation targets to encompass the entire range of the western chimpanzee, including all habitat types, and as such the needs of populations in all habitat contexts equitably, and thereby extending the scope of conservation actions to tackle the region-wide issues that threaten them. These threats and the measures detailed

to deal with them are viewed solely at the subspecies' level and provide the scaffold for future national and sub-national plans tailored to local contexts. Nonetheless, many actions needed for chimpanzee conservation should be defined at the national level, as threat intensity imperils chimpanzee populations differentially at different scales, and the scale of action varies according to the intervention.

Figure 1. Conservation Action Planning process

Table 1. Conservation targets defined during the stakeholder workshop

Conservation Target	Predominant geographic range
Chimpanzees in large, connected forests	Côte d'Ivoire, Liberia
Chimpanzees in small, fragmented forests	Côte d'Ivoire, Ghana, Sierra Leone
Chimpanzees in savanna mosaics	Côte d'Ivoire, Guinea, Guinea-Bissau, Mali, Senegal
Chimpanzees in agricultural mosaics	Guinea, Guinea-Bissau, Sierra Leone
Cultural and genetic diversity of chimpanzees	All range countries

Definition of vision and scope of the plan

Stakeholders at the 2017 workshop formulated the following vision (in three languages) and scope for the action plan.

Vision (English): A connected landscape where western chimpanzees and their habitats are valued, protected and thriving; ensuring mutually beneficial coexistence for current and future generations of chimpanzees and humans.

Énoncé de vision (Français): Un paysage connecté où les chimpanzés de l'Afrique de l'ouest et leurs habitats sont valorisés, protégés et prospères; et où on assure une coexistence mutuellement bénéfique pour les générations actuelles et futures de chimpanzés et d'humains.

Declaração da Visão (Português): Uma paisagem conectada onde os chimpanzés ocidentais e seus habitats são valorizados, protegidos e prósperos; e onde a coexistência mutuamente benéfica para as gerações atuais e futuras de chimpanzés e humanos é assegurada.

Scope: The geographic scope of the plan was defined as the geographic range of the western chimpanzee and encompasses an area of *c.*523,000 km^2. Western chimpanzees currently occur in eight West African countries: Côte d'Ivoire, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Senegal and Sierra Leone.[1]

1 The affinities of chimpanzees in western Nigeria are being investigated as there is uncertainty about whether they are the Nigeria-Cameroon subspecies *(Pan troglodytes ellioti*) or western chimpanzees. If new information becomes available, the scope of the plan could be enlarged accordingly.

SECTION 2. STATUS OF WESTERN CHIMPANZEES

Biology and ecology of western chimpanzees

Western chimpanzees live in multimale-multifemale, fission-fusion communities (meaning that the social unit is not cohesive and may split and merge depending on time of day, availability of reproductive females and food). Communities typically range in size from 11 to 63 individuals. Chimpanzees are generally male philopatric, meaning that females tend to leave their natal community when they reach reproductive age. They are a long-lived species (maximum lifespan *c*.50 years) with extensive maternal care; infant dependency is among the longest in the animal kingdom (Williamson *et al.* 2013). Chimpanzees build nests to sleep in every night and occasionally to rest in during the day. Nests are valuable indirect signs of chimpanzee presence and are counted in most great ape surveys (Kühl *et al.* 2008).

Most chimpanzee communities demonstrate some degree of territorial defence (Herbinger *et al.* 2001; Samuni *et al.* 2017). However, when the frequency of inter-community encounters increases because chimpanzees are forced to shift their home range due to habitat loss or disturbance, there is a risk that such interactions can escalate into physical fights that can be fatal. Each community occupies a home range, varying from 8 km^2 (Vieira *et al.* 2019) to 89 km^2 (Pruetz 2018), depending on resource availability (Lehmann & Boesch 2003). Particularly in the hot and dry northern reaches of the range, chimpanzees are dependent upon the availability of freestanding water sources (Wessling *et al.* 2018). Western chimpanzees live in a wide range of ecotypes, from the sparse and arid habitats of Senegal and Mali to the wet lowland rainforests of Liberia and southern Côte d'Ivoire, as well as agricultural and anthropogenic landscapes across the region in question, notably in Sierra Leone, Guinea and Guinea Bissau. These habitats vary considerably in their forest cover, from 2% or less in the northernmost savanna mosaics (Garriga *et al.* 2019; Lindshield *et al.* 2019; Wessling *et al.* in review) to high degrees of canopy cover in forested areas (see, for example, Boesch & Boesch-Achermann 2000). Chimpanzee diets consist of plant matter, with a strong preference for fruit, although all communities studied also eat meat (often other primates, such as galagos *Galago* spp. or colobus monkeys *Colobus* and *Piliocolobus* spp.), insects (termites, ants) and insect products (honey, insect nests; Samuni *et al.* 2018). In some locations, chimpanzees are known to crack and eat nuts (Bossou: Sugiyama & Koman 1979; Sapo: Anderson *et al.* 1983; Taï National Park: Boesch & Boesch-Achermann 2002), fish for algae (Humle *et al.* 2011; Boesch *et al.* 2017a), and hunt primates with the help of tools (Pruetz *et al.* 2015).

Western chimpanzees show considerable behavioural flexibility, which enables them to cope with and persist in human-impacted habitats. This includes dietary flexibility with human crop consumption (Hockings & McLennan 2012), the use of leaf tools to ingest palm wine (Hockings *et al.* 2015), and anthropogenic landmarks (such as roads: Hockings *et al.* 2006) and other human intrusions (such as snares: Ohashi & Matsuzawa 2011).

A party of chimpanzees grooming, Taï National Park, Côte d'Ivoire © Liran Samuni/TCP

Current knowledge of chimpanzee distribution in West Africa

Pan troglodytes verus occurs in eight countries: Côte d'Ivoire, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Senegal and Sierra Leone. Chimpanzees have already been extirpated from Benin, Burkina Faso and Togo (Ginn *et al.* 2013; Campbell & Houngbedji 2015); Ghana may soon be added to this list, as only a small number of individuals remain in the southwest of the country (Kühl *et al.* 2017).

Guinea, Liberia and Sierra Leone are the strongholds of this subspecies, harbouring the largest chimpanzee populations in the region (see below). In Côte d'Ivoire, their numbers have declined by 80% since 1990 due to anthropogenic pressures and land conversion, corresponding to a range contraction of 20% (Kühl *et al.* 2017). Only a few hundred remain in two national parks, Taï and Comoé (Campbell *et al.* 2008; Granier *et al.* 2014) (see Box I).

Data on the range limits in Guinea-Bissau, Mali and Senegal are scarce. Recent information indicates that the northern limits are likely near Hérémakhono, Senegal (Wessling *et al.* 2019, in review). Surveys in Senegal (Ndiaye *et al.* 2018) indicate that chimpanzees are widespread, although there is some discrepancy between modelled estimates and previously published estimates (Heinicke *et al.* 2019a). In Mali, the chimpanzee's range limits remain unclear and no surveys outside Bafing and Moyen-Bafing national parks have been undertaken since 2004 (Duvall 2008). The widespread distribution of chimpanzees in Guinea-Bissau has been confirmed (Carvalho *et al.* 2013; Bersacola *et al.* 2018), although population trends could not be derived due to a lack of historical estimates.

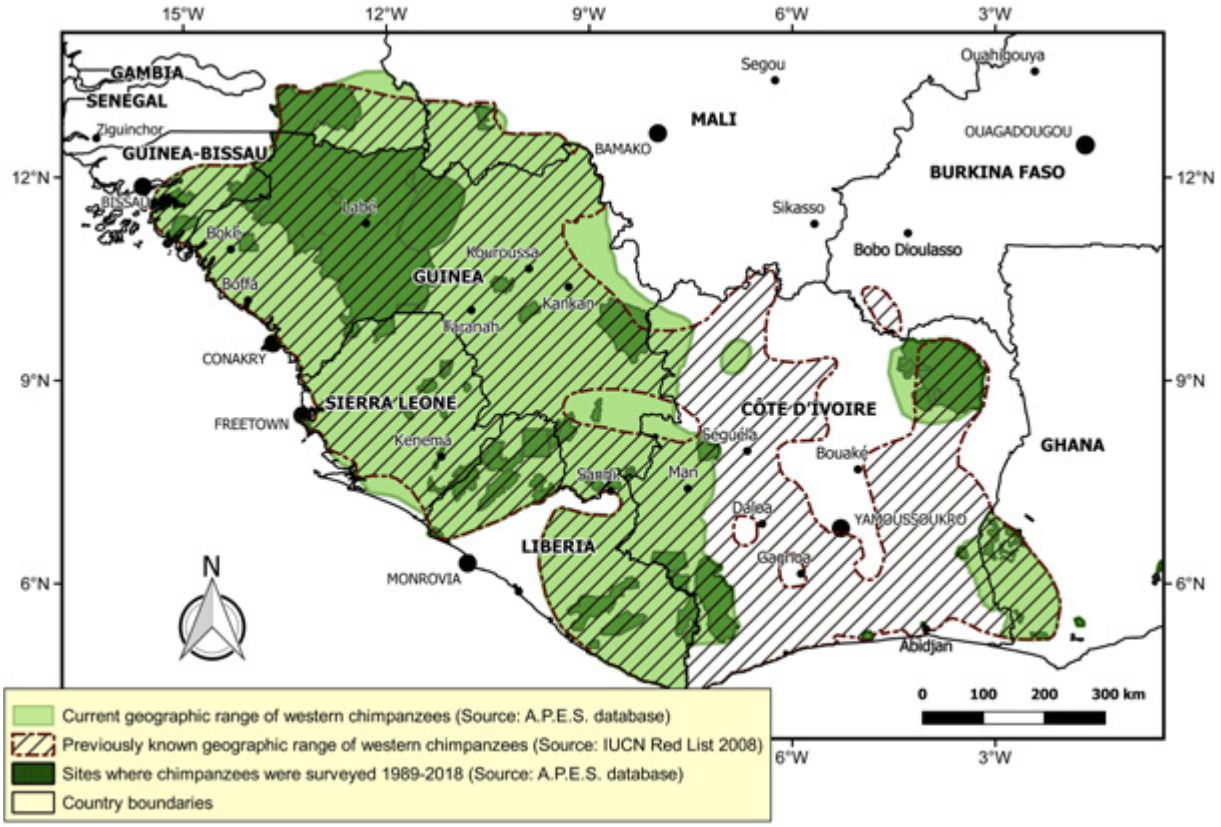


Figure 2-1. Current and previously known geographic range of western chimpanzees based on Kühl *et al.* 2017 (map: Tenekwetche Sop)

Box I: Alarming decline of western chimpanzees in Côte d'Ivoire

One example of a country in which western chimpanzee loss has been extensively and closely monitored over time is that of the unprecedented and exceptional decline of chimpanzee populations in Côte d'Ivoire. It was once home to likely one of the largest western chimpanzee populations, but natural habitat in most of the country has been lost to the industrial agricultural sector (for example, for coffee, cacao, palm oil). Now chimpanzees are largely found only in two national parks: Taï and Comoé. These two parks likely harbour only a few hundred individuals, whereas remnant populations outside park boundaries hang on with less than 100 individuals. Similar declines have occurred even in protected areas, such as the Marahoué National Park, where chimpanzees were extirpated (Kühl *et al.* 2017) in just a few years (Campbell *et al.* 2008) because of inadequate law enforcement, lack of immigration controls and poor park management. As such, the chimpanzee range in Côte d'Ivoire has been reduced by 70.3% (T. Sop, pers. comm.), and an analysis of chimpanzee population patterns in the country suggested already dramatic declines by 2008 (Campbell *et al.* 2008). These declines appear to have continued into 2014 (Kühl *et al.* 2017), despite longstanding and extensive efforts made to conserve this species in Côte d'Ivoire, demonstrating the difficulty in mitigating ongoing threats to chimpanzee populations in the region (see Figure 2-2).

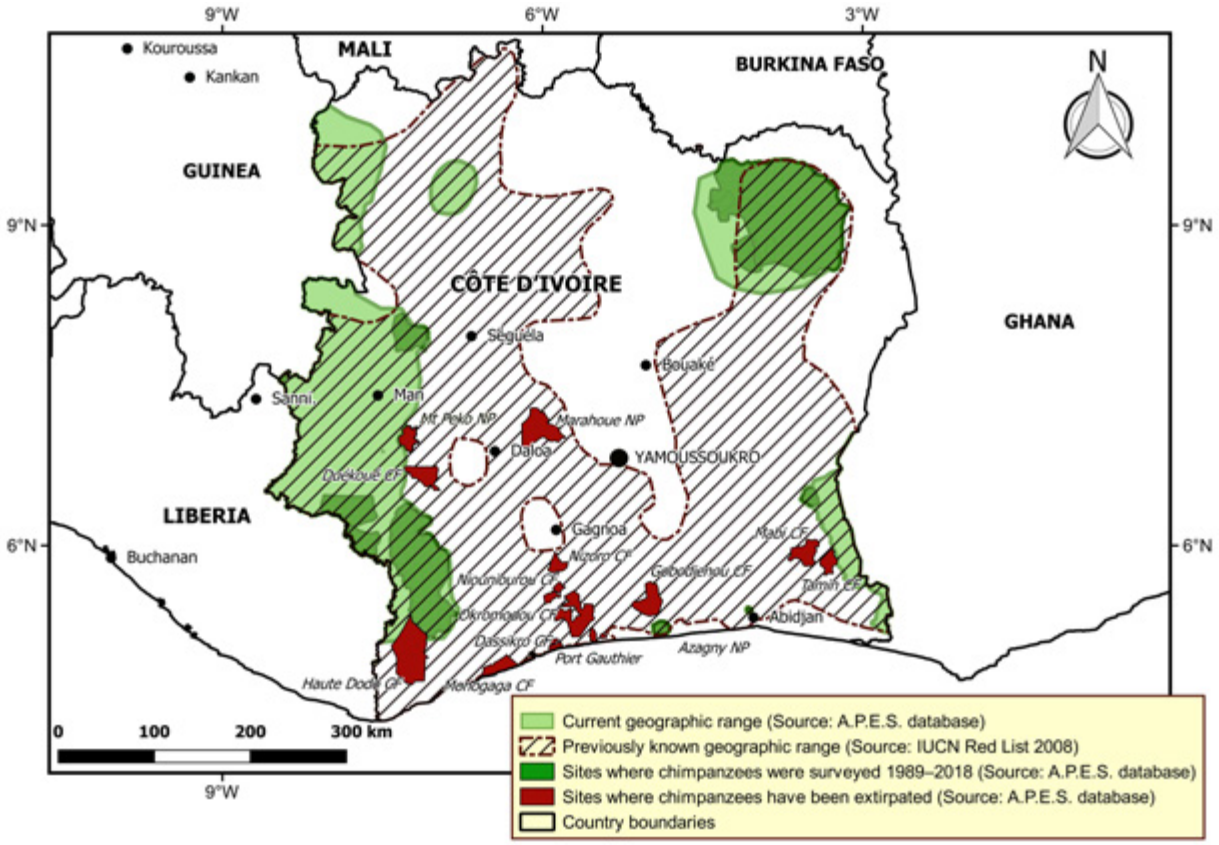


Figure 2-2. Current and previously known geographic range of chimpanzees in Côte d'Ivoire, highlighting sites where chimpanzees have been extirpated. Based on Campbell *et al.* 2008 and Kühl *et al.* 2017 (map: Tenekwetche Sop)

Population estimates

The IUCN SSC Ape Populations, Environments and Surveys database (hereafter A.P.E.S.) was established in 2005 (Kühl *et al.* 2007). This repository now includes many survey datasets (listed in Sop *et al.* 2018), including the Guinean section of Fouta Djallon (WCF 2013), and national datasets for Côte d'Ivoire (Campbell *et al.* 2008), Liberia (Tweh *et al.* 2015) and Sierra Leone (Brncic *et al.* 2010). Combining local surveys with large-scale surveys allows estimates to be projected for unsurveyed areas and informs on general patterns at a larger scale. At the regional scale, Kühl *et al.* (2017) compiled abundance data from 35 sites to estimate population trends and geographic range for western chimpanzees, and Heinicke *et al.* (2019a) compiled 52 density surveys to model the density distribution of western chimpanzees. A brief summary of the results is provided below.

Heinicke *et al.* (2019a) estimate total western chimpanzee abundance to be 52,800 individuals (95% confidence interval:

17,600–96,600 individuals), with densities ranging from <0.01 to 6.3 individuals/km^2. The largest national populations occur in Guinea, Liberia and Sierra Leone (Table 2), and the highest chimpanzee densities were predicted for the Fouta Djallon.

Chimpanzee abundance estimated for Ghana was extremely low, corresponding with on-the-ground estimates from sites surveyed. Nationwide estimates for both Liberia and Sierra Leone are similar to previously published estimates (Brncic *et al.* 2010; Tweh *et al.* 2015). The range-wide estimate for Guinea was considerably higher than previous design-based estimates (WCF 2013, 2015), as the range-wide model accounts for unsurveyed regions and predicted chimpanzee densities for these areas. The estimate for Senegal is considerably higher than estimated in the previous regional action plan (200–400; Kormos & Boesch 2003), therefore Senegal is the fourth most populated western chimpanzee range state. Such apparently large increases in estimated population size reflect methodological differences and suggest that far more suitable habitat remains than had been previously recognised.

The vast majority of chimpanzees remaining are found in savanna-dominated habitats (78%), followed by forest-dominated habitats (16%) and cropland habitats (5%). Their densities are generally lower in mosaic habitats than contiguously forested habitats.

Kühl *et al.* (2017) and Heinicke *et al.* (2019b) both suggested that there are eight exceptionally stable or high chimpanzee density sites in the region, identified by successive surveys: Taï National Park (Côte d'Ivoire), Grebo-Kahn National Park (Liberia), greater Nimba Mountain region (Côte d'Ivoire, Guinea, Liberia), Boé National Park (Guinea-Bissau), Gola National Park (Sierra Leone), Fouta Djallon (Guinea) and Goin-Débé (Côte d'Ivoire). These sites are characterised by a low degree of forest loss (for example, Grebo, Taï), steep terrain (for example, Nimba), research presence (for example, Taï), social taboos against the killing of chimpanzees (for example, Fouta Djallon), presence of protected areas, or remoteness. Not all chimpanzee sites have been sampled, so additional factors enabling chimpanzee persistence might be relevant at other sites.

A clear take-away from past and recent studies is that chimpanzees are negatively affected by certain types of anthropogenic disturbance, As of 2018, only 17% of western chimpanzees occur in PAs designated as national parks or IUCN Category I or II PAs, with 83% of the population living outside high-level PAs. However, remoteness will continue to dwindle, as nearly 40% of chimpanzees already live within 5 km of a human settlement and nearly 60% are within 5 km of a road (Heinicke *et al.* 2019a). There is, therefore, a pressing need to mitigate, reduce or remove ongoing threats in the face of chimpanzee losses due to anthropogenic pressure. Some evidence that socio-cultural beliefs and norms facilitate chimpanzee conservation in certain regions has begun to emerge (Boesch *et al.* 2017b; Heinicke *et al.* 2019b).

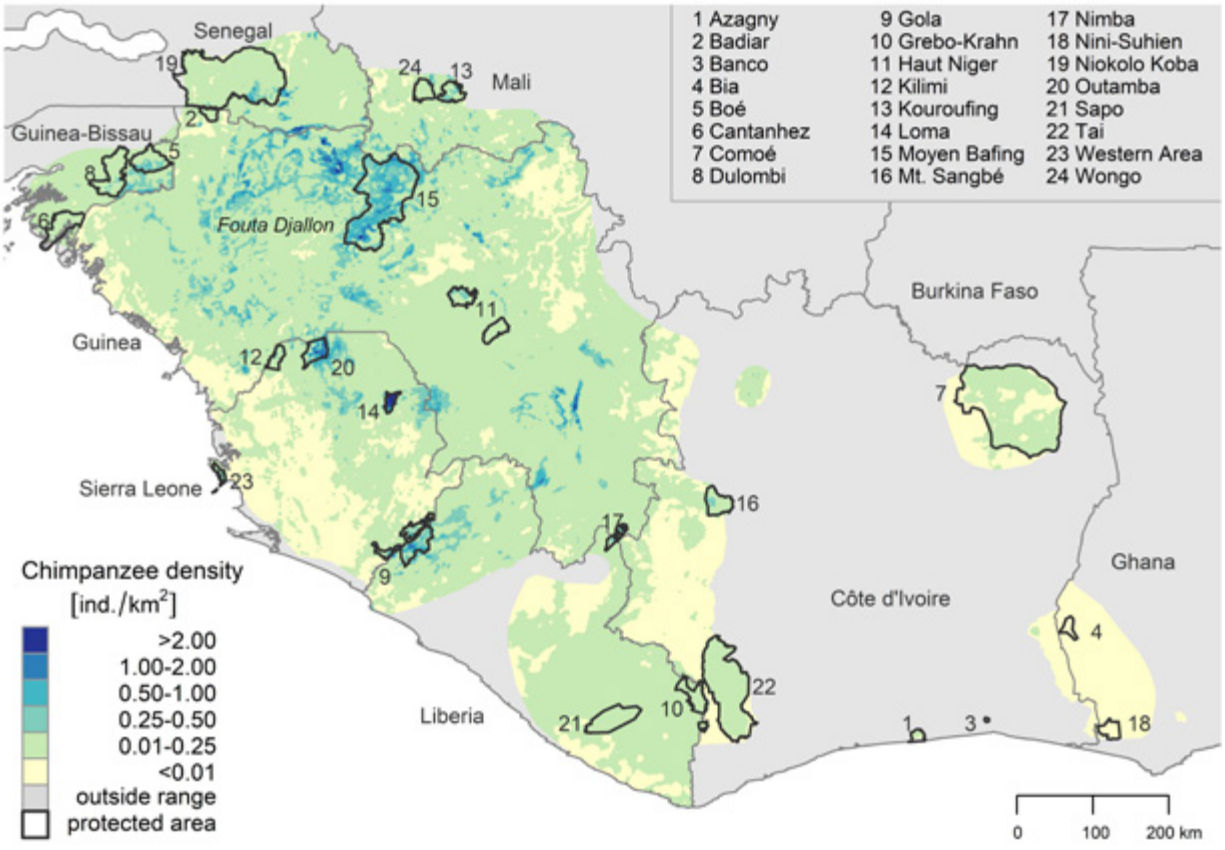


Figure 2-3. Modelled density distribution of western chimpanzees across their range (reproduced from Heinicke *et al.* 2019a, CC BY 3.0)

People passing a cave often used by chimpanzees. Réserve Naturelle Communautaire de Dindéfélo, Senegal © Erin Wessling

Table 2. Modelled chimpanzee abundance estimates

Country	**Estimated chimpanzee abundance modelled (with 95% confidence intervals)**[2] In some cases, a second abundance estimate is given based on previously published survey results. However, the abundance numbers for Côte d'Ivoire and Ghana are site specific and not national in scope.
Côte d'Ivoire	**1,093 (329–3,299; Heinicke *et al.* 2019a)** 580 (332–940, surveyed areas only; Tiédoué *et al.* 2016; A.P.E.S. database)
Ghana	**24 (1–212; Heinicke *et al.* 2019a)** 264 (18–843; Bia-Goaso only; Danquah *et al.* 2012)
Guinea	**33,139 (8,796–68,203; Heinicke *et al.* 2019a)**
Guinea-Bissau	**1,908 (923–6,121; Heinicke *et al.* 2019a)**
Liberia	**6,050 (2,902–13,690; Heinicke *et al.* 2019a)** 7,008 (4,260–11,590; Tweh *et al.* 2015)
Mali	**2,029 (322–9,228; Heinicke *et al.* 2019a)**
Senegal	**2,642 (1,077–13,293; Heinicke *et al.* 2019a)**
Sierra Leone	**5,925 (1,951–12,668; Heinicke *et al.* 2019a)** 5,580 (3,052–10,446; Brncic *et al.* 2010)
Total	**52,811 (17,577–96,564; Heinicke *et al.* 2019a)** 35,000 (15,000–65,000, surveyed areas only; Kühl *et al.* 2017)

2 Modelled density distributions are always associated with uncertainty. Specifically, uncertainties were higher for areas with few data points and for which predicted chimpanzee density was low. However, there was no systematic bias in the spatial distribution of uncertainty (see Heinicke *et al.* 2019a Supplementary Figure S1).

Important conservation areas

To support systematic conservation planning for western chimpanzees, Heinicke *et al.* (2019c) used the modelled chimpanzee density distribution introduced above and a spatial prioritisation algorithm to identify important geographic areas for conservation of the subspecies. Based on scenarios that account for different spatial scales and conservation targets, the study identified Fouta Djallon and 14 transboundary areas shared by Côte d'Ivoire, Guinea, Liberia and Sierra Leone as being particularly important (Figure 2-3). While there was a strong overlap with priority areas identified in the first regional action plan for this subspecies (Kormos & Boesch 2003), the analysis highlighted the importance of the north-south connectivity across the chimpanzee's range from southern Senegal to northern Sierra Leone. The areas mapped areas are presented here to inform stakeholder consultation processes, such as the expanding a PA network, identification of priority sites, the designation of "no-go" zones for industry and infrastructure projects, and where to target conservation activities outside PAs. For countries with small chimpanzee populations, especially Ghana, scenarios run separately for each country will be more informative for determining where conservation activities should be targeted. Further information is available via the IUCN SSC A.P.E.S. database.

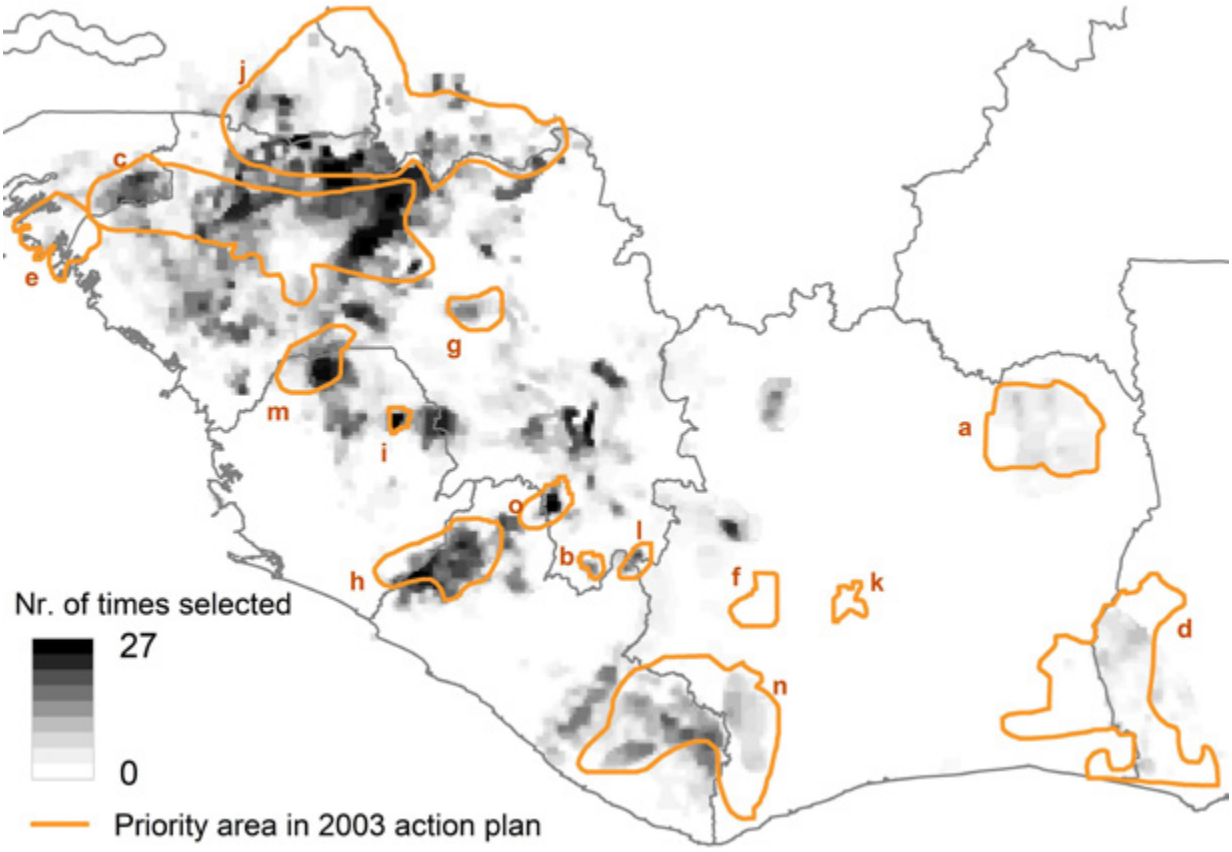


Figure 2-4. Important conservation areas for western chimpanzees with the number of times a cell was selected summed up across 27 scenarios overlapping the Kormos and Boesch (2003) priority areas for (a) Comoé, (b) Diéke, (c) Fouta Djallon, (d) Ghana-Côte d'Ivoire border, (e) Guinea-Guinea-Bissau coastal, (f) Haute Sassandra and Mt Péko, (g) Haut Niger, (h) Lofa-Mano-Gola forests, (i) Loma mountains, (j) Manding plateau, (k) Marahoué, (l) Nimba mountains, (m) Outamba-Kilimi and Guinea border, (n) Taï-Grebo-Sapo-Cestos, (o) Ziama and Wonegizi (reproduced from Heinicke *et al.* 2019c, CC BY 3.0)

The need to act quickly: Red List status uplisted to Critically Endangered in 2016

In 2016, IUCN uplisted the western chimpanzee from Endangered to Critically Endangered (Humle *et al.* 2016a), reflecting the dire status of the subspecies unless further declines are averted. The western chimpanzee has already been extirpated in three of the 11 countries where it ranged historically. Couple this with a range reduction of 20% in just eight years, western chimpanzees are on a clear trajectory of widespread extirpation and loss of genetic and behavioural diversity, unless effective and drastic measures are taken immediately. Worse yet, over 10% of the population occupies habitat already earmarked for large-scale infrastructure projects (Heinicke *et al.* 2019a), in addition to extensive overlap with land targeted for industrial extraction or agriculture (Lanjouw 2014; Rainer 2014; Wich *et al.* 2014). Heinicke *et al.*'s (2019a) model also provides a clear indication that chimpanzees will continue to endure severe anthropogenic pressures in the future, as most of the subspecies' geographic range is unprotected.

SECTION 3. THREATS TO WESTERN CHIMPANZEES

Ranking of current threats

A list of potential threats to western chimpanzees was drawn up based on common threats to great ape populations: habitat loss (through industrial and subsistence agriculture, industrial and artisanal mining, industrial and artisanal logging, charcoal production, roads, bush, savanna and forest fires), disease, and poaching (i.e. illegal killing, including human chimpanzee conflict and live capture). Workshop participants in each target group were asked to choose the six highest current threats to chimpanzees. Each group then ranked these threats according to a scale from 'Very High' to 'Low' corresponding to the perceived threat of each chosen threat category (Table 3; see Appendix II for threat ranking methodology).

The relative importance of different threat levels varied considerably by target category, by habitat and by location, thereby making it difficult to conserve western chimpanzees with broad-stroke efforts, and highlighting the need for a diverse array of locally-appropriate conservation interventions. However, summation of target group rankings also highlights regional consistencies. For instance, subsistence agriculture and poaching (including live capture) were rated as 'very high' threats to chimpanzees across the region. A number of other drivers of habitat loss (including mining, industrial agriculture and roads), as well as disease and challenges associated with human-chimpanzee coexistence, were rated as 'high' level threats. Industrial logging and bush fires were rated as 'medium' threats, while artisanal logging and charcoal production were rated as 'low'.

Ratings from the workshop echo threat summaries from previous studies. For example, Tranquilli *et al.* (2014) found that poaching and agriculture were among the most prevalent threats to the persistence of chimpanzee populations in PAs in West Africa; a survey of conservationists also rated poaching as the most severe threat to chimpanzees (Neugebauer 2018). In these surveys, poaching was the only threat rated highly across spatial scales, although mining, agriculture and infrastructure development were also rated highly (ibid.). Although artisanal logging was rated as a significant threat to wildlife in West African PAs by Tranquilli *et al.* (2014), threat rankings from the workshop closely mirror findings from Neugebauer (2018), who rated artisanal logging as a minor threat.

Workshop participants discuss strategies for conserving savanna chimpanzees. Monrovia, Liberia © Erin Wessling

Table 3. Ranking of current threat categories across conservation targets*

Targets/ Threats	Chimpanzees in agricultural mosaics	Chimpanzees in large, continuous forests	Chimpanzees in savanna mosaics	Chimpanzees in small, fragmented forests	Cultural and genetic diversity of chimpanzees**	Summary Threat Rating
Subsistence agriculture	Very High	High	High	High	Unspecified	Very High
Poaching (including live capture)	Medium	Very High	Medium	Very High	Unspecified	Very High
Industrial mining		High	Very High	High	Unspecified	High
Artisanal mining	Very High	Low	High		Unspecified	High
Disease	High			Very High	Unspecified	High
Human-chimpanzee conflicts	High		Low	High	Unspecified	High
Industrial agriculture		High		Very High	Unspecified	High
Roads	Very High				Unspecified	High
Industrial logging		High			Unspecified	Medium
Bush, savanna and forest fires			High		Unspecified	Medium
Artisanal logging, charcoal production					Unspecified	Low

* The top six threats were identified and ranked for each conservation target
** The working group on cultural and genetic diversity did not rank threats for their target

Description of threats

According to the IUCN Red List of Threatened Species, the western chimpanzee faces the highest risk of extinction relative to the other subspecies of chimpanzee (Humle *et al.* 2016b). The causes of their decline are complex and difficult to counteract. Indeed, the predictors of western chimpanzee presence include both anthropogenic and ecological factors whether at a large (Heinicke *et al.* 2019b) or a small scale (Garriga *et al.* 2019).

The predominant causes of western chimpanzee population decline are direct killing, habitat loss and disease. The impacts of poaching and disease are relatively apparent; however, the impacts of habitat loss on chimpanzees are less straightforward and are typically borne of multiple overlapping origins.

Poaching (including live capture)

Hunting of wildlife has caused significant declines in large mammal populations in West Africa (see, for example, Brashares *et al.* 2004; Gonedelé *et al.* 2010), a pattern that extends to chimpanzees (Campbell *et al.* 2008). One of the most cited causes of chimpanzee decline is poaching, even though the killing of great apes is outlawed in all range states (GRASP & IUCN 2018). Poaching can be broken down into a number of types according to the motivation behind it or context in which a great ape is killed (Williamson 2018).

Bushmeat poaching

Chimpanzees are killed predominantly for their meat. They typically make up a small proportion of bushmeat sold (chimpanzee carcasses constituted 1–3% of bushmeat sold in urban markets in Côte d'Ivoire; Caspary *et al.* 2001); however, approximately 3.5% of the Ivorian chimpanzee population is poached annually for the bushmeat trade (Covey & McGraw 2014). A complex web of factors promotes chimpanzee poaching, highlighting the pervasive nature of the problem. For example, Junker *et al.* (2015a) found that evidence of hunting in Liberian forests was likely to be recorded further away from human settlements, but closer to markets. Ultimately, distance to markets was the strongest anthropogenic negative predictor of chimpanzee abundance (ibid.). This correlation was mirrored in Guinea (Boesch *et al.* 2017b).

Poaching extends into PAs (Tranquilli *et al.* 2014). Greengrass (2016), for example, found that 90% of chimpanzees poached from Sapo National Park were sent directly to urban markets, and that hunting pressure increased when remote areas became connected to a commercial network, resulting in subsequent declines in wildlife abundance. Poaching and trade of bushmeat are often facilitated by industrial logging, and other types of resource extraction and infrastructure development, which make previously remote areas more accessible to hunters and transport to markets easier (see, for example, Kormos *et al.* 2003b; White & Fa 2014).

Bushmeat (guenon monkeys and zebra duiker) for sale at a rural market, Côte d'Ivoire © WCF

Killing for superstitious purposes

The use of chimpanzee body parts for superstitious practices (for example, Sá *et al.* 2012) is often a by-product of killing to obtain meat; however, chimpanzees are sometimes killed specifically for traditional ceremonies or animistic practices (Hanson-Alp *et al.* 2003; Sousa *et al.* 2017).

Retaliatory killing

Great apes are killed over real or perceived competition with humans for natural resources (Hockings & Humle 2009). Retribution killings may follow crop-foraging or people being injured. Illegal killing is exacerbated when natural habitat is cleared or converted to other land uses, and these situations may fuel a live trade in infants.

Live capture

Capturing live chimpanzees, which is in itself illegal, almost always involves the killing of conspecifics, as taking an infant necessitates killing the mother. The capture of orphaned chimpanzee infants is usually opportunistic and associated with poaching for bushmeat (GRASP & IUCN 2018). It is also a secondary effect of habitat loss and negative human-wildlife interactions.

The true scale of live capture and trade is unknown due to the clandestine nature of illegal trafficking, which has become associated with organised crime, such as drug smuggling, and is therefore difficult to detect and monitor (Clough & May 2018). While the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is intended to

prohibit all commercial trade in chimpanzees, traffickers continue to abuse and evade laws. In West Africa, traffickers can easily travel with smuggled orphans to neighbouring countries through land borders and seaports where enforcement is weak or lacking. Although considerable efforts to improve law enforcement in recent years have been made, the Pan African Sanctuary Alliance (PASA) sanctuaries in Guinea, Liberia and Sierra Leone report a persistent influx in orphaned chimpanzees to their facilities, while new facilities in Cote d'Ivoire and Liberia have also witnessed high numbers of arrivals.

Empty shotgun cartridges dropped by poachers, Taï National Park, Côte d'Ivoire © WCF

Agriculture

The impacts of agricultural expansion on chimpanzees are well recognised, and anthropogenic conversion of natural habitat to other land uses is so extensive in parts of the region that forest-farm mosaics are the predominant modelled habitat type for 5% of western chimpanzees (Heinicke *et al.* 2019a). Conversion of natural habitat for agricultural purposes is so widespread – 1% in only four years – that western chimpanzees are the only African apes for which habitat losses to agriculture could be remotely sensed (Palminteri *et al.* 2018). Although agriculture did not show a significant effect on chimpanzee densities in a recent model, highest modelled chimpanzee densities are found only in areas with less than 25% cropland cover, suggesting that an upper tolerance limit might exist (Heinicke *et al.* 2019b); however, this varies from country to country.

Subsistence agriculture

Subsistence agriculture is small-scale farming by rural communities, employing an estimated 70% of Africa's workforce (Acheampong *et al.* 2018). Although West Africa is experiencing increasing rates of urbanization, rural populations are also expected to increase in the coming decades (Blein *et al.* 2013). As human populations grow, local demand for resources accelerates, and this translates into increased demand for arable land. Historically, in Africa, where cropland increased by approximately 25% between 1980 and 2000 (Gibbs *et al.* 2010), agricultural expansion has come overwhelmingly at the cost of intact forests, accounting for 60% of land converted for agriculture, and another 35% at the cost of disturbed forests (Brink & Eva 2008; Gibbs *et al.* 2010). As such, land conversion for subsistence agriculture directly impacts available habitat for chimpanzees in the region. Shifting farms closer to forest habitats is often another source of negative human-chimpanzee interactions.

Industrial agriculture

Much of West Africa is suitable for agricultural production of coffee, cacao, rubber and palm oil (Kühl *et al.* 2017), and such developments are expected to further accelerate chimpanzee losses in the region (Ancrenaz *et al.* 2015).

Slash-and-burn agriculture, Moyamba District, Sierra Leone © Tatyana Humle

Significant habitat losses have already occurred, for example, in Côte d'Ivoire through cocoa production (Bitty *et al.* 2015). If investment in an Africa-based oil palm boom continues, some of the last bastions of western chimpanzees – areas suitable for oil palm plantations – could be devastated (Côte d'Ivoire 59.6%, Liberia 81.7%, Sierra Leone 48.8%; Wich *et al.* 2014). Oil palm is native to the region, and chimpanzees incorporate oil-palm and cacao fruits into their diet, some to the extent that they rely on these foods for survival (see, for example, Humle & Matsuzawa 2004). However, it is likely that most chimpanzees would not survive clearcutting of their habitat, not least because they are unable to exist long term in large-scale monocultures, which lack nutritional and nesting resources, and their presence is otherwise not tolerated (Ancrenaz *et al.* 2015).

Disease

Chimpanzees are highly susceptible to diseases of human origin because of their genetic and physiological similarities with humans (Leendertz *et al.* 2006; Köndgen *et al.* 2008). Respiratory infections, polio, anthrax and scabies have all been documented in great apes (see Gilardi *et al.* 2015). Of particular concern is Ebola virus disease (EVD), as transmission is rapid and mortality in great apes is over 90% of individuals infected (see review by Leendertz *et al.* 2017). Although there is no evidence that chimpanzees were affected by the 2014–2016 epidemic in humans in West Africa, EVD killed chimpanzees in Côte d'Ivoire in the mid-1990s, and caused dramatic chimpanzee and gorilla declines in Gabon and Congo (Walsh *et al.* 2003).

The frequency of encounters between chimpanzees and people is increasing as human populations expand and encroach into chimpanzee habitat. This leads to higher risks of disease transmission. The risks are typically greater for chimpanzees that live in close proximity to human communities, and which may also come into contact with human waste, including faeces.

Disease transmission risks are also exacerbated when tourists, researchers and project staff frequently come within a few metres of chimpanzees that have been habituated for research or tourism (see, for example, Leendertz *et al.* 2006; Hanamura *et al.* 2008; Scully *et al.* 2018). Infectious diseases are the main cause of death in chimpanzees at Bossou, Guinea (Humle 2011) and Taï, Côte d'Ivoire (Köndgen *et al.* 2008). Respiratory viruses that resulted in high levels of morbidity and mortality at Taï have been confirmed to be of human origin (ibid.), including a coronavirus (Patrono *et al.* 2018). In addition, international tourists are more likely to be carrying novel diseases to which chimpanzees have never been exposed. The implementation of human quarantine and strict hygiene rules for researchers and other longer-term visitors (such as film crews) is, therefore, highly recommended (Gilardi *et al.* 2015; Grützmacher *et al.* 2018).

IUCN best practice guidelines for great ape tourism and for health monitoring and disease control in great ape populations recommend restricting the numbers of tourists and researchers visiting each day, limiting the number and duration of visits, maintaining a minimum distance of 7 metres between chimpanzees and humans, and the wearing of face masks if within 10 metres (Macfie & Williamson 2010; Gilardi *et al.* 2015) (see Box II).

Research assistants wearing face masks to minimise the risk of transmitting disease to the habituated chimpanzees they are following. Taï Chimpanzee Project, Côte d'Ivoire © Sonja Metzger/TCP

Box II: Applying Best Practice to Chimpanzee Tourism and Research

Great ape tourism is often proposed as a strategy to fund conservation efforts, and a way for local communities to benefit from conservation. While tourism has been very successful at a few sites, it will not be possible to replicate this success everywhere. Tourism poses a large number of risks and must, therefore, be based on sound conservation principles from the outset. Over-exploitation will threaten the survival of chimpanzees and habitat if economic objectives take precedence.

Tourism with chimpanzees can have both positive and negative impacts. To optimise the positive impacts, tourism development must be founded on and guided by IUCN guidelines for tourism (Macfie & Williamson 2010) and for disease prevention (Gilardi *et al.* 2015).

The potential benefits of chimpanzee tourism include enhanced health monitoring, veterinary care and protection of habituated chimpanzees. Revenue can be generated for protected area management, community livelihoods, private sector partners and national economies. Participation in tourism enhances community support for conservation, and generates political goodwill, local and national pride, regional cooperation, international awareness and donor support. As a result of all the above, conservation of chimpanzees and their habitats can be improved.

The potentially negative impacts of chimpanzee tourism are numerous, and increased risks of poaching, disease transmission and stress are among the most worrying. Tourism is expensive to establish and operate and tourism initiatives must be viable from a business perspective because, once habituated, chimpanzees must be protected in perpetuity to shield them from the risks mentioned above. If not properly managed, tourism and research create opportunities for disease transmission between humans and chimpanzees (Gilardi *et al.* 2015). Habitat degradation and pollution around tourist infrastructure are also of concern and will lead to a cumulative negative impact on chimpanzees and their habitats. Impacts on local communities can include increased human-great ape conflict, human in-migration, cultural dilution and unplanned development.

Guiding Principles of IUCN Best Practice in Great Ape Tourism:

1. Tourism is not a panacea for great ape conservation or revenue generation.
2. Tourism can enhance long-term support for conservation of great apes and their habitat.
3. Conservation comes first and must be the primary goal at any great ape site, and tourism can be a tool to help fund it.
4. Great ape tourism should only be developed if the anticipated conservation benefits, as identified in impact studies, significantly outweigh the risks.
5. Enhanced conservation investment and action at great ape tourism sites must be sustained in perpetuity.
6. Great ape tourism management must be based on sound and objective science.
7. Benefits and profits for communities adjacent to great ape habitat should be maximised.
8. Profit to private sector partners and others who earn income associated with tourism is also important but should not be the driving force for great ape tourism development or expansion.
9. Comprehensive understanding of potential impacts must guide tourism development; positive impacts from tourism must be maximised and negative impacts must be avoided or, if inevitable, better understood and mitigated.

For full details and discussion, download the IUCN tourism guidelines at: https://portals.iucn.org/library/node/9636

Human-chimpanzee interactions[3]

In West Africa, approximately 80% of the original forest cover that was present in the 19th century is now agricultural-forest mosaic (Norris *et al.* 2010). Human use of core chimpanzee range areas to access water, forest or wildlife products, and chimpanzees entering human agricultural areas and settlements can increase encounter rates, heightening disease transmission risks (see above), among other potentially negative outcomes. Such intensification in spatial overlap can trigger or aggravate competition for water (Pacheco *et al.* 2012) and food – both wild foods harvested by people and cultivated human foods consumed by chimpanzees (Hockings & McLennan 2012). Across Africa, chimpanzees have been reported to eat 36 different crop species (ibid.).

In most situations, unhabituated chimpanzees will flee upon seeing or hearing a human; however, if provoked and chimpanzees perceive humans as a threat, they may behave aggressively (McLennan & Hockings 2016). Moreover, problematic chimpanzee behaviour, such as attacks on local people, is sometimes attributed to "sorcery" (Sousa *et al.* 2017), emphasising the need to understand both human and chimpanzee components of interactions when developing conservation strategies (Hockings 2017).

Any intolerance or fear of chimpanzees – whether based on real or perceived costs and risks – may result in people chasing chimpanzees or, in extreme cases, killing them. Situations involving the injury, killing or capture of chimpanzees can also aggravate relations between farmers, labourers and landowners and protected area authorities (PAAs) and managers, challenging conservation efforts for the species as interests and values clash (Redpath *et al.* 2013). Significant efforts are required to address such conflicts and promote win-win coexistence scenarios. Often they demand interdisciplinary research, awareness raising, dialogue and local engagement in decision-making processes. Issues of human-chimpanzee coexistence are complex and dynamic, as they are embedded in a web of ecological, socio-economical, cultural and political contexts that are often locally specific. However, as human populations increase and landscapes continue to change across West Africa, there will likely be misalignments between the needs of both people and chimpanzees. Development and conservation agendas will sometimes clash, resulting in growing intolerance, and negative attitudes and behaviours towards chimpanzees. This risks accelerating chimpanzee population declines, although in some regions cultural taboos may buffer this effect (Yamakoshi 2005; Heinicke *et al.* 2019b).

Adult male chimpanzee passing behind a house in Bossou village, Guinea, to reach a papaya tree. Such bold crop-foraging behaviour can lead to negative interactions between chimpanzees and local people © Tatyana Humle

3 Terms such as 'conflict', 'crop-raiding', 'raider' and 'thief' that cast chimpanzees as conscious antagonists of people are increasingly perceived as detrimental to efforts to foster coexistence between people and wildlife (Peterson *et al.* 2010). It is recommended that such loaded terms are avoided.

Mining

West Africa is rich in minerals, including bauxite, gold, iron, phosphate and diamonds (N'Diaye 2015). This abundance provides the potential for industries and governments to profit from industrial extraction, as well as a scramble among locals at the artisanal level to exploit these resources for cash. These two types of mining operate under vastly different systems and magnitudes, and therefore the impacts they impart on the landscape are considerably different. Industrial mining operates under a formalised system with governmental oversight and involves multinational companies typically funded multilaterally, whereas artisanal mining is often informal and disorganised, typically undertaken by economically marginalised people (see, for example, Hilson & Garforth 2012).

Stakeholders rated the threat of mining at both scales as 'high', and with less than 5% of global mineral exploitation occurring in Africa (Taylor *et al.* 2009), the potential for growth in West Africa is of great concern for future impacts upon chimpanzees.

Industrial mining

Given this potential, Africa is stated to be on the "verge of an unprecedented mining boom" (Edwards *et al.* 2014). Attracting billions of dollars in foreign investment, and slated by local governments as an opportunity to stimulate rapid economic growth and development (for example, Republic of Liberia 2017), industrial mining development is a substantial opportunity for human development, but one which is likely to compete with environmental protection, and can erode the ecosystem services upon which poor rural communities depend (Kühl *et al.* 2017).

Due to its large scale and destructive nature, industrial mining has substantial and direct impacts upon chimpanzee habitats, either through degradation and fragmentation or direct removal of the resources the chimpanzees need (White & Fa 2014; Williamson *et al.* 2014). Less commonly acknowledged, however, are the numerous and wide-ranging indirect impacts that mining at this scale has upon chimpanzees and other wildlife, most especially driving ecosystem degradation and infrastructure development (see below), and stimulating human influxes to otherwise remote regions (Laurance 2018a,b), besides the impacts on human health, which include water, air and noise pollution.

Industrial mining development offers short-term financial incentives for governments and frequently economically outweighs incentives for conservation (Republic of Liberia 2017). Although most West African governments and the multilateral lending banks (for example, World Bank Group) require mining projects to conduct Environmental and Social Impact Assessments (ESIAs), the ESIA review system is flawed and is typically limited to evaluation of direct – but not indirect – impacts. ESIAs are usually carried out after significant and destructive explorative activity has already occurred. Most commonly, the discovery of the presence of chimpanzees in a project license does not deter companies from advancing projects or discourage investors from supporting these projects (Kormos *et al.* 2014). Instead, companies detail mitigation and avoidance strategies of varying quality, which are then often not implemented in full, especially if the company changes hands. There has been little oversight or monitoring of projects to ensure that mitigation was done effectively. In a few cases, some degree of offsetting for anticipated negative impacts has been proposed (ibid.).

Bauxite mining, Boké region. Guinea has the largest bauxite reserves in the world © Kalyanee Mam

Artisanal mining

Although artisanal and small-scale mining (ASM) is an activity that has been ongoing for centuries throughout much of West Africa. It has become more common and widespread in recent decades, to become a significant threat to chimpanzee populations regionally. In contrast to large-scale mining, ASM is commonly informally or semi-formally organised, and undertaken with improvised or rudimentary tools and simple machinery (Villegas *et al.* 2013). In West Africa, typical ASM commodities are gold and diamonds (Small 2012; Villegas *et al.* 2013). ASM sites may be associated with large-scale mining projects, taking advantage of the mineral resources found locally, or located wherever informal exploration has identified small-scale deposits that are obtainable and sufficiently profitable (Edwards *et al.* 2014).

Artisanal gold mining pits, Senegal © Erin Wessling

Infrastructure

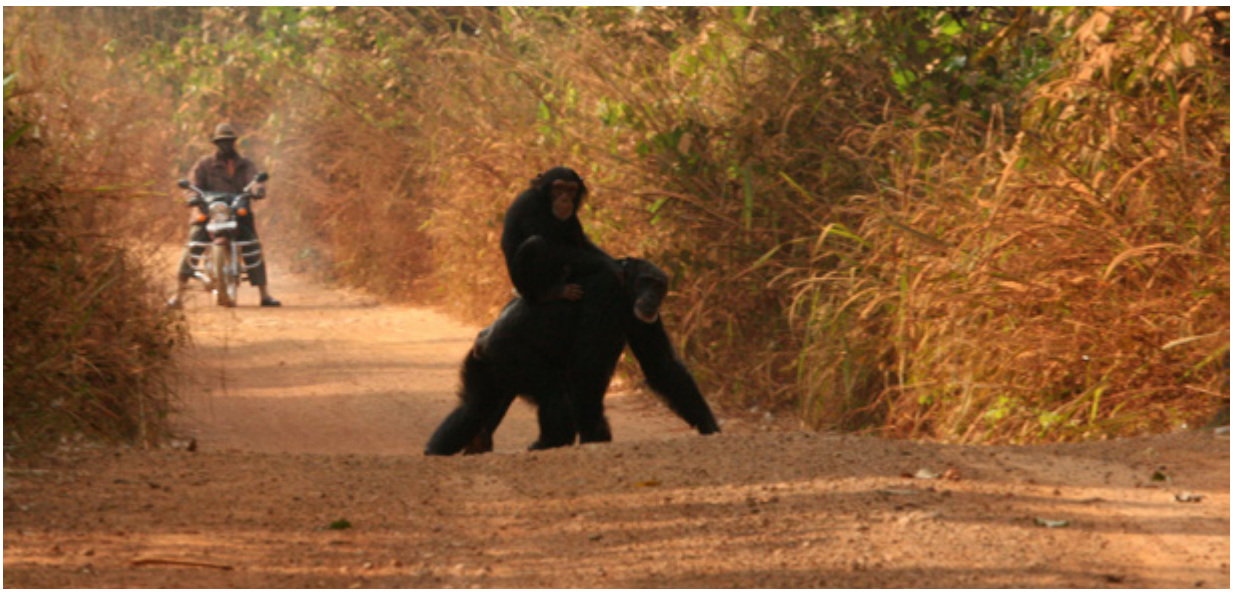
With projects such as roads, railroads, hydroelectric dams and power lines projected to increase sharply over the next few decades (Laurance & Balmford 2013), West Africa is experiencing an era of major infrastructural expansion (Laurance 2018a,b). Such developments are regarded as a much-needed boon for the economic status of West African nations (African Development Bank 2014). Yet, as beneficial as they should be for people in these regions, infrastructural developments are widely-recognised for their association with significant habitat loss and degradation (for example, Laurance *et al.* 2009), and accelerating other drivers of habitat and biodiversity loss (Laurance *et al.* 2006; Poulsen *et al.* 2009; Ziegler *et al.* 2016), which can have negative consequences for people by destroying and degrading the resources upon which they depend. In addition, the benefits from some projects do not even reach the rural poor who need them most. On the contrary, people are sometimes displaced by such projects without compensation (Wormington 2018; O'Mahony 2019). If chimpanzee habitat is continually sacrificed for economic development, then the outcome is simple: we will lose chimpanzees. No amount of mitigation for hydroelectric dams is going to avoid chimpanzee fatalities. If a project is sincere about preventing the local demise of chimpanzees, then careful consideration must be given as to where they be placed so that chimpanzee habitat is avoided in the first place.

Roads are a prime example of infrastructure that has negative impacts on chimpanzees and other wildlife. Often built to support extractive industries, such as mining and logging concessions, and to improve access for otherwise poorly-connected rural populations, the construction of roads destroys and fragments habitat, and opens up previously inaccessible areas (Sloan *et al.* 2017; Laurance *et al.* 2018b). Roads that cut through chimpanzee habitat may limit the chimpanzees' access to food and nesting trees, depending on road width and usage (Hockings *et al.* 2006). Further yet, roads enable poaching in previously unprofitable areas (Junker *et al.* 2015b; Greengrass 2016), which results in chimpanzee population declines and ultimately local extirpation.

It has been forecast that approximately 10% of remaining African ape habitat will be impacted by infrastructure projects by the year 2030 (Nellemann & Newton 2002), signalling infrastructure development as a real and imminent threat to great apes, including western chimpanzees. Four large-scale infrastructure corridors have already been proposed for West Africa, which alone are expected to affect 10% of western chimpanzees (Heinicke *et al.* 2019a). This compounds

further already existing threats of roadways to chimpanzees, as over 88% of the population is estimated to live within 10 km of a major road (ibid.).

Other anticipated impacts in the region relate to the construction of hydroelectric dams, with at least 32 dams planned or under construction as of 2015 (Zarfl *et al.* 2015). Many of these potential projects intersect prime chimpanzee habitat, such as the Fouta Djallon highlands in Guinea. Most notably, the planned Koukoutamba dam has already provoked a global outcry due to the unquestionable consequences its construction will have for chimpanzees and other wildlife in the newly-gazetted Moyen-Bafing National Park in Guinea (Schembri 2018; Watts 2019).



Female chimpanzee carrying her juvenile offspring across a road. Bossou, Guinea © Susana Carvalho

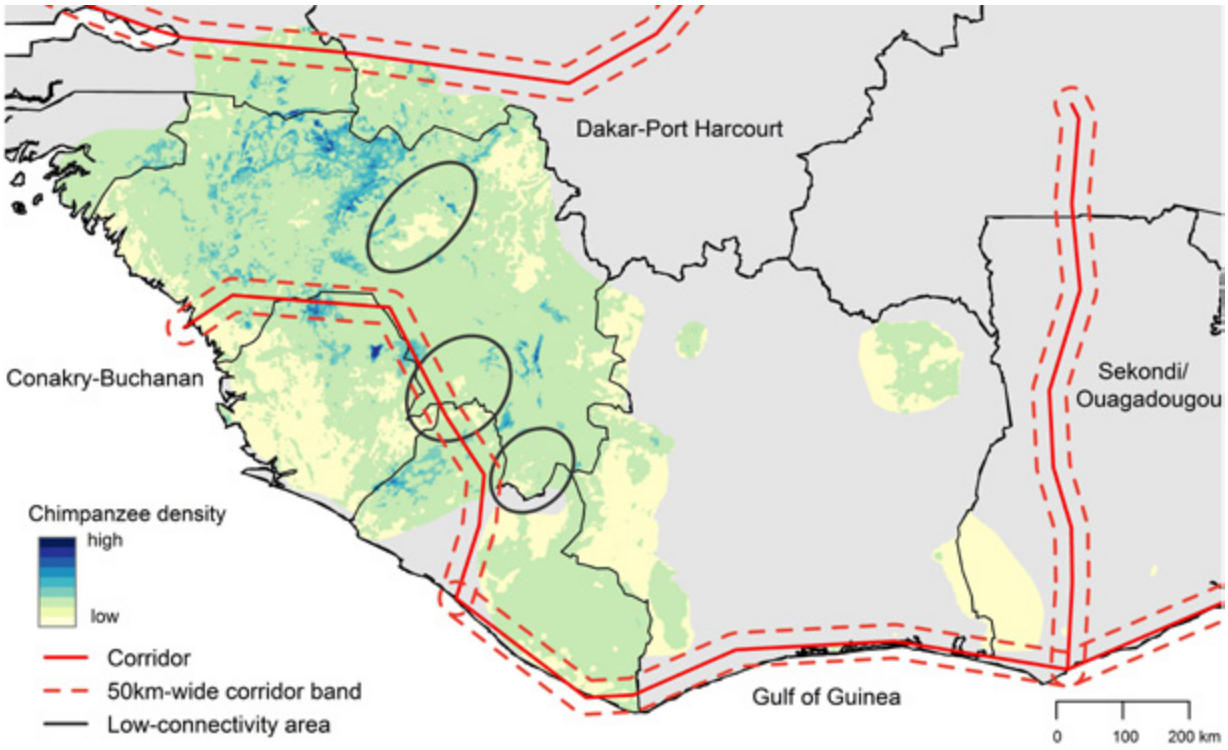


Figure 3. Overlap between planned development corridors and western chimpanzee densities. Circles represent areas of low-connectivity across chimpanzee populations, where population connectivity might be low or be reduced in the future with further land-use change or increase in threats (reproduced from Heinicke *et al.* 2019a, CC BY 3.0)

Industrial logging

Industrial logging has both direct and indirect impacts on chimpanzees. Most obviously, for a semi-arboreal species that depends heavily on forested habitats for food and nesting, the chimpanzee's ecological needs compete directly with the financial interests of logging companies. Chimpanzees lose habitat when trees are felled (Morgan & Sanz 2007), while the secondary impacts of logging include road expansion and facilitation of poaching (ibid.; Poulsen *et al.* 2009). Even selective logging has been linked to negative physiological impacts on the reproductive success of chimpanzees (Emery Thompson *et al.* 2007), as preferred food or nesting tree species may be removed and habitat use disrupted (Morgan *et al.* 2013).

Logging discovered by WCF during independent forest monitoring, Cavally Classified Forest, Côte d'Ivoire © WCF

Artisanal logging

Similar to industrial logging, artisanal logging has negative impacts on chimpanzees, albeit at a smaller scale. Although no large swaths of forest cover are felled, artisanal logging is more likely to target tree species that are key to chimpanzees. For example, several of the nesting species preferred by chimpanzees in Senegal, such as the hardwoods *Pterocarpus* and *Khaya* (Ndiaye *et al.* 2013), are sought after by local communities (Massa 2011; Gning *et al.* 2013). These species are also felled as fodder for domestic animals by nomadic pastoralists (Massa 2011), thereby creating a situation where competition is intense at local scales.

Bush, savanna and forest fires

In the woodland-grassland regions of West Africa, fire has played a historical part in shaping ecosystems in the more arid biomes (Laris 2002; Giglio *et al.* 2006) – the West African savanna mosaic landscapes in Mali, Senegal, and the northern regions of Côte d'Ivoire and Guinea. Although thought to be caused naturally by lightning strikes in drier habitats, humans have been responsible for starting the majority of wildfires in the region for several centuries (Bird & Cali 1998).

Marked increases in fire frequency and intensity over the past century have been linked to human activity, predominantly corresponding to increases in the number and timing of wildfires, as well as the structure and abundance of fire fuels (Bowman *et al.* 2011). The introduction of grazing animals, reductions in megafauna, crop production, forest clearing, and early fire suppression are among a myriad of factors contributing to an increased likelihood of fires (Mbow *et al.* 2000; Bowman *et al.* 2011). Furthermore, humans are responsible for intentional and accidental fires for even more varied reasons, such as flushing out game for hunting, preparing fields for agriculture, pest reduction, as firebreaks, or simply clearing land for easier travel (Mbow *et al.* 2000; Laris 2002).

While human influence on current fire intensities is clear, little research has been conducted into the negative ecological effects of fire in West Africa, leading some to conclude that the detrimental aspects of fire are overemphasised (Laris 2002). Historically, fires shaped habitat heterogeneity in these landscapes and perhaps even increased plant biodiversity (Danthu *et al.* 2003). It would appear that a key component of the impact of fires in these landscapes is the timing of the fires themselves. Nonetheless, more research is needed to understand the role of fire in the ecosystem, the human contribution to this interchange, and ultimately the direct impacts of fire on chimpanzees in savanna mosaic regions.

Bush fire in Upper Niger National Park, Guinea © CCC

Other drivers of western chimpanzee losses

Other drivers of chimpanzee population decline include but are not limited to the following:

Inconsistencies in legislation across countries

Legislation, penalties for non-compliance with environmental laws, and the ease with which animals can be traded differ in each country. As national borders in West Africa are relatively open and may be crossed without formal checks, inconsistencies in national legislation across the region add to the challenges already presented by weak law enforcement.

Lack of consideration of chimpanzees in land-use planning

Although land-use planning (LUP) exercises are typically multi-sectorial and multi-step processes that include many considerations – ranging from economic to social, logistical and environmental needs – chimpanzees are rarely taken into account. In LUP, this is due in part to the unavailability of data on chimpanzee distributions, but importantly also to the omission of data as a result of insufficient political or economic interest in chimpanzees.

Inadequate governance of industry

Both national governments and international organisations have structures in place to regulate industrial resource use and extraction; however, the mechanisms by which these industries are evaluated are neither well-structured nor adequately evaluated regarding their impacts on chimpanzees and other wildlife. Often, the benefits to local governments of facilitating partnerships with international industry partners outweigh the benefits of adequately overseeing their impacts on wildlife within their borders, and legal frameworks designed to protect environmental resources are often subverted or ignored (Laurance 2004). This is equally relevant to infrastructural development projects spearheaded by national governments themselves and which therefore do not need to undergo explicit environmental and social impact reviews. As such, extractive and other development project impacts are not sufficiently mitigated or avoided. Furthermore, governance capacity to evaluate the impacts of infrastructural or extractive projects is often inadequate even when the will is there (Edwards *et al.* 2014).

Inadequate financial and logistical resources for chimpanzee conservation

While conservation practitioners may be aware of what is required to effectively conserve chimpanzees, in many cases they are ill-equipped. Conservation practitioners and the relevant government agencies in range countries are rarely prioritised by the governments that support them, leaving them inadequately staffed and underfunded. Inadequate maintenance of infrastructure and equipment compounds the logistical challenges.

Weak environmental governance

Although it is illegal throughout Africa to capture or trade in chimpanzees or chimpanzee body parts (GRASP & IUCN 2018), clandestine trafficking still occurs. This is due to the lack of enforcement of national laws and inadequate judicial capacity to prosecute offenders. The lack of capacity of environmental agencies to fully implement international agreements such as CITES reflects a low level of national and regional political will to address the issue of wildlife crime.

SECTION 4. PRIORITY STRATEGIES AND ACTIONS

Method of strategy identification

Prior to the workshop, participants identified four conservation targets based on landscape type: chimpanzees in large connected forests, small fragmented forests, savanna mosaics and agricultural mosaics. During the workshop, a fifth conservation target was added to ensure adequate consideration of the genetic and cultural diversity of chimpanzees.

A conceptual model or 'results-chain' was developed by workshop participants for each of the five conservation targets. The workshop participants then reviewed each of the conceptual models and identified common themes that were subsequently integrated into the following nine conservation strategies:

- Strategy 1: Definition of Norms and Best Practices
- Strategy 2: Elimination of Research and Data Gaps
- Strategy 3: Policy Development and Legal Framework Review
- Strategy 4: Regional Coordination to Address Illegal Chimpanzee Trade
- Strategy 5: Disease Monitoring and the One Health Model
- Strategy 6: Land-Use Planning
- Strategy 7: Maintenance, Strengthening and Establishment of Protected Areas
- Strategy 8: Awareness Raising
- Strategy 9: Conservation Financing

For each strategy, objectives were developed to be specific, measurable, achievable, realistic and time bound. These objectives serve two purposes: they provide i) detail of how each of the strategies will be implemented, and ii) the means by which the effectiveness of this action plan will be evaluated. The 'actions' attributed to each objective are the activities requiring implementation by identified stakeholders to conserve western chimpanzees. In the tables that follow, methods to be used, indicators of completion and suggested implementers are given for each action.

Research assistant collects data on chimpanzees of the Fongoli research community, Senegal © Nicole Wackerly

Strategy 1: Definition of norms and best practices

Conservation managers need access to the best techniques to implement programmes to counter the impacts of artisanal mining, human-wildlife conflict, forestry, agriculture and other threats. Defining norms and best practices for carrying out conservation activities should be rooted in the best available science. This strategy presents recommendations to enable those working to conserve great apes to apply best practice to a range of high priority threats.

Definition of best practices for mitigating the impacts of artisanal mining

Artisanal mining is a widespread and significant threat to western chimpanzees living in and outside PAs in all eight countries in their range. The main negative impacts associated with this activity are habitat loss and disturbance, habitat pollution, poaching and the potential for disease transmission (Small *et al.* 2012). The impacts of artisanal mining can be greater for chimpanzees than impacts of industrial development projects because a large number of people can move into an area and quite quickly destroy habitat without any mitigation.

Several West African countries have adopted legislation to regulate artisanal mining; nonetheless, this sector remains generally unregulated and laws are rarely reinforced (MacDonald 2003). The majority of artisanal miners continue, therefore, to be unregistered. There are no best practice guidelines, and no coordination to tackle and reduce potential environmental impacts. Developing and implementing new regulatory frameworks is a challenge, but the following objectives aim to strengthen environmental governance at the regional level.

Objective 1.1: By 2022, best practice standards for artisanal mining are defined and applied by all actors in the region.

Objective 1.2: By 2024, West African countries with chimpanzee populations have harmonised policies on artisanal mining.

Objective 1.3: By 2022, stakeholders of artisanal mining i.e. national environmental agencies (NEAs), mining-focused NGOs and miners, are aware of the laws surrounding artisanal mining and are educated on best practices for reducing impacts on chimpanzees.

Table 4-1. Actions needed to achieve a regional standardisation of artisanal mining policy and application of best practices on artisanal mining

Actions	Methods	Indicators	Implementers
Production and dissemination of IUCN best practice guidelines for mitigating the impacts of artisanal mining on chimpanzees that includes a model artisanal mining policy.	Convene a workshop with representatives from all eight countries to develop best practices and model artisanal mining policy. Identify an editor, establish a publication committee, and write guidelines.	Publication is finalised and disseminated in all eight countries. Number of countries that have established or updated their artisanal mining policy using the model.	NGOs with assistance from the SGA

Definition of best practices for mitigating negative human-chimpanzee interactions

Human-chimpanzee 'conflicts' involve competition for space, food and water, but also a clash in stakeholder groups' values and interests. The latter may challenge the balance between conservation and development objectives and people's attitudes and behaviour towards coexistence with chimpanzees (see, for example, Madden & Quinn 2014). Habitat loss and human frequentation of chimpanzee habitat and chimpanzee foraging incursions into crop fields or plantations and settlements where fruit trees such as papaya, orange and mango are found can also exacerbate negative attitudes and behaviour towards chimpanzees (Clake *et al.* in prep.), and can sometimes cause chimpanzees to react aggressively. Significant efforts are required to align development needs and interests, and land-use and conservation planning to strengthen people's tolerance and promote positive behaviours toward chimpanzees. But as local communities increasingly report issues with chimpanzees or chimpanzees are killed, injured or captured in retaliation, it is critical for relevant parties (whether governmental or NGO) to be equipped to provide adequate advice and recommendations for understanding and managing potential 'conflict' situations.

Objective 1.4: By 2022, update and apply best practices for mitigating negative human-chimpanzee interactions.

Objective 1.5: Within the first year of its publication, all relevant stakeholders are aware of the best practice guidelines for mitigating negative people-chimpanzee interactions.

Table 4-2. Actions needed to identify and define best practices for mitigating negative human-chimpanzee interactions

Actions	Methods	Indicators	Implementers
Production and dissemination of IUCN best practice guidelines for managing negative human-chimpanzee interactions that include a chapter on protocols for conducting research on these interactions.	Convene a workshop with representatives from all eight countries, including researchers from different disciplines to develop best practices and new protocols to guide research on people-chimpanzee coexistence.	Updated practical best practice guidelines.	SGA, IUCN SSC Human-Wildlife Conflict Task Force, researchers
Conduct research to improve knowledge of people-chimpanzee coexistence using newly established protocols to evaluate mitigation strategies and identify research gaps.	Researchers use agreed research protocols to improve knowledge of human-chimpanzee coexistence and the effectiveness of known mitigation strategies.	Findings published in peer-reviewed journals or shared on knowledge-sharing platforms.	SGA, IUCN SSC Human-Wildlife Conflict Task Force, researchers

Definition of best practices for mitigating the impacts of agricultural, logging and mining development

Industrial development projects include all large-scale projects in the agricultural, logging, mining, renewable and infrastructure sectors. Best practice guidance for mitigating impacts on chimpanzees mainly follows the mitigation hierarchy (Figure 4). The mitigation hierarchy aims to avoid impacts first, then reduce, rehabilitate and compensate any significant impacts that remain.

The application of best practice calls for governments, banks and companies to avoid planning and funding development projects in chimpanzee habitat from the outset. Where projects proceed in chimpanzee habitat, best practice requires that all industrial development projects aim to avoid potential negative impacts as much as possible, as this is the most effective step of the mitigation hierarchy and is the one that involves the least uncertainty. Where avoidance is not possible, minimising impacts is necessary, although the effectiveness of the majority of minimization measures has never been tested and thus their usefulness remains uncertain. Habitat rehabilitation efforts through the creation of chimpanzee dispersal corridors can help to maintain connectivity across the landscape; however, these usually require many years before benefits accrue for chimpanzees. Finally, offsets are controversial and should only be used as a last resort, when a project has exhausted all other steps of the mitigation hierarchy. There remains much uncertainty around offsets; there is no good example to date of successfully offsetting impacts on chimpanzees in West Africa (Kormos *et al.* 2014). Four major projects (three mining and one a hydroelectric dam) are currently considering offsets for their impacts on chimpanzees in Guinea, Senegal and Sierra Leone, and they may provide lessons that can be used for the development of an offsetting framework for chimpanzees.

The International Finance Corporation's (IFC) Performance Standards, which guide their lending to projects, necessitate that clients follow the mitigation hierarchy and include special mention of great apes in the PS6 Guidance Note of 27 June 2019 (IFC 2019) – see Box III.

Unfortunately, best practice standards are followed by industries active in Africa only when there is a pressure from lenders to apply their standards, where the legislation refers to the mitigation hierarchy or where a company possesses corporate voluntary best practice commitments. Fortunately, large projects that receive financing from the IFC are likely to implement best practice guidelines. Great-ape-specific best practice guidance has been developed for the logging sector (Morgan & Sanz 2007) and specifically for Forest Stewardship Council certification (Morgan *et al.* 2013).

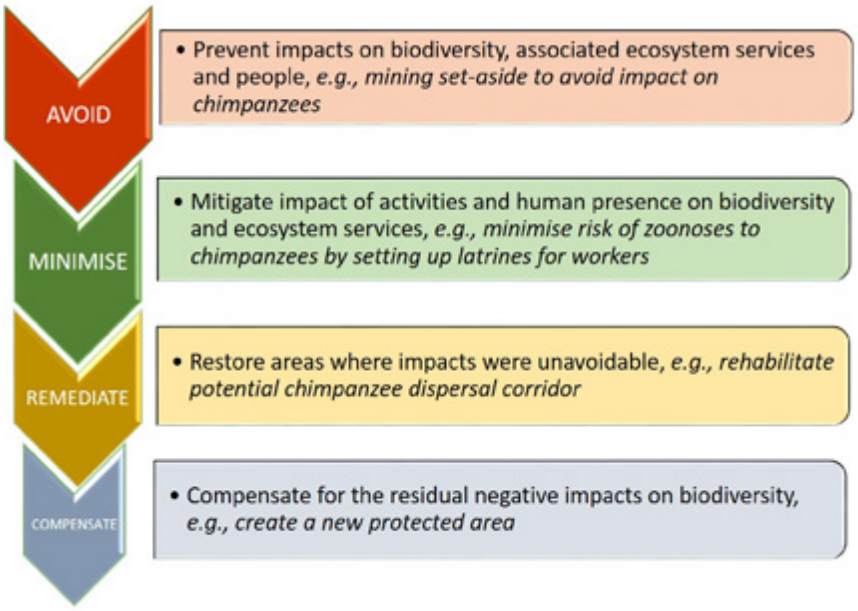


Figure 4. The mitigation hierarchy with examples for mitigating impacts on chimpanzees

Box III: ARRC Task Force (Avoidance, Reduction, Restoration and Compensation)

The IUCN SSC Primate Specialist Group ARRC Task Force is an alliance of conservationists advocating for the Avoidance, Reduction, Restoration and Compensation of negative impacts on apes and their habitat from energy, extractive and associated infrastructure (EEAI) projects. Their aim is not only to halt ape population declines, but also to promote their recovery.

The scale of EEAI projects in ape habitat is massive, with investment totalling billions of dollars. To date, conservationists have not been able to respond at appropriate scales either in terms of the time or the dedicated resources needed. As a result, we are still losing the battle to protect human's closest living relatives. Most ape species are declining precipitously – western chimpanzee numbers dropped by 80% in the last 24 years, and Grauer's gorillas declined from an estimated 17,000 to below 4,000 in just 20 years. Among the most urgent threats to western chimpanzees are bauxite and iron-ore mining and hydroelectric dams. The greatest threat to the newly discovered Tapanuli orangutan is the proposed Batang Toru dam, which will fragment habitat to such an extent that it could push the orangutans to extinction.

Given the scale of the threat of large-scale mining and infrastructure activities to apes, the IUCN SSC Primate Specialist Group's Section on Great Apes (SGA) and Section on Small Apes (SSA) launched a new task force to focus on how negative impacts on apes from these processes can be reduced or avoided altogether. Called the ARRC Task Force, this group of ape conservation experts aims to target each stage of EEAI projects, from the planning phase to improved mitigation, rehabilitation and compensation for project impacts. The Task Force also looks for opportunities to focus on ways that projects not only do less harm to apes, but instead contribute positively to their conservation.

As a result of collaboration between the Task Force and the IFC, the IFC has taken the unprecedented step of requiring clients to consult with the SGA regarding any projects in planning that may impact great ape habitat. This presents a tremendous opportunity for the ape conservation community to engage with governments and industry to avoid and reduce impacts on critical habitat.

IFC PS6. GN73. *"Special consideration should be given to great apes (gorillas, orangutans, chimpanzees and bonobos) due to their anthropological significance. Where great apes may potentially occur, the IUCN Species Survival Commission (SSC) Primate Specialist Group (PSG) Section on Great Apes (SGA) must be consulted as early as possible to assist in the determination of the occurrence of great apes in the project's area of influence. Any area where there are great apes is likely to be treated as critical habitat. Projects in such areas will be acceptable only in exceptional circumstances, and individuals from the IUCN SSC PSG SGA must be involved in the development of any mitigation strategy".* (p.21).

The full text of PS6 is available at: https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/performance-standards/ps6

Objective 1.6: By 2022, best practices for mitigating the impacts of agricultural, logging and mining development have been defined and published, or updated.

Objective 1.7: By 2026, 100% of projects active in areas of ape habitat adhere to best practices for mitigating impacts of agricultural, logging and mining development.

Objective 1.8 Within the first year of its publication, 100% of stakeholders involved in infrastructural, agricultural and extractive industry projects in West Africa implement best practice in ESIAs.

Table 4-3. Actions needed to identify and define best practices for mitigating the impacts of agricultural, logging and mining development

Actions	Methods	Indicators	Implementers
Production and dissemination of a pamphlet to communicate chimpanzee-friendly practices and guidance for the agriculture, mining, logging, renewable and infrastructure sectors, including a map of existing chimpanzee distribution.	Produce succinct pamphlet to share with relevant stakeholders.	Chimpanzee-friendly practices are published and used by companies in industrial development sectors.	ARRC Task Force, IFC, NGOs

Establishment of standards for environmental and social impact assessments

Existing national legislation in each of the western chimpanzee range states requires development projects with potentially significant environmental and social impacts to conduct Environmental and Social Impact Assessments (ESIA). However, the quality of ESIAs varies with the strength of national legislation, its review process, external pressure from lenders and/or alignment with best practice standards by a project. Environmental legislators, companies and lenders (such as IFC) are increasingly integrating or referencing the mitigation hierarchy in their standards.

Objective 1.9: By 2024, 100% of industrial development projects adopt the mitigation hierarchy and implement the management plans presented in their ESIAs.

Objective 1.10: By 2025, all regulatory governmental bodies are aware of ESIA standards for chimpanzee monitoring and best practice guidelines and use these guidelines in their evaluation of ESIAs.

Table 4-4. Actions needed to establish standards for Environmental and Social Impact Assessments (ESIAs)

Actions	Methods	Indicators	Implementers
Identification of industrial development projects requiring an ESIA starting with the highest priority chimpanzee areas.	Create a database and identify active projects using the relevant online registry and/or by contacting relevant ministries.	A database of active industrial development projects is created.	ARRC Task Force, SGA, NGOs
Development of a standardised framework for reviewing ESIAs and management plans aimed at minimising the impacts on chimpanzees, including a monitoring protocol and scoring system.	Review existing approaches and identify partners to develop a framework. Consolidate findings into a database.	A standardised framework for reviewing and monitoring ESIAs and their associated management plans is available.	Environmental agencies, IFC, ARRC Task Force, SGA, NGOs

Surveying for signs of chimpanzees, Senegal © Erin Wessling

Establishment of standards for fire management

As fire intensities, duration and frequencies increase, both human livelihoods and western chimpanzees are increasingly under threat. Occurring predominantly in more open habitats, bush fires are increasingly relevant to natural resource management in all countries in the region. Fire-management expertise varies substantially across agencies, and coordination in fire management practice across national borders is minimal. Most of the existing fire management research and expertise has been developed in the grassland habitats of South Africa. There is, therefore, a need to establish regionally relevant fire management standards that are borne of regional expertise and incorporate existing best practice standards for fire management from experts across the continent.

Objective 1.11: By 2024, a regionally relevant set of fire management standards is defined and implemented by all national environmental agencies (NEAs).

Table 4-5. Actions needed to establish standards for fire management

Actions	Methods	Indicators	Implementers
Development and dissemination of a set of regionally appropriate fire management standards to protected area managers, government authorities and conservation NGOs.	Hold a meeting between relevant NEAs, PA managers, and global fire management experts to establish standard fire management practices. Publish and disseminate standards.	Standards published and distributed; increased number of NEAs and PAs employ newly established standards.	

Strategy 2: Elimination of research and data gaps

Accurate, comprehensive and up-to-date information on western chimpanzee populations is required to guide effective conservation activities. This strategy highlights the actions necessary to better understand western chimpanzee distribution, population trends, baselines of genetic and cultural diversity, measures that will improve the effectiveness of conservation actions and increase knowledge and understanding of illegal trade in chimpanzees.

Distribution and status data gaps

It is imperative for successful conservation action to be based upon a sufficient understanding of the status of the taxon of interest. Here, such understanding includes having (1) comprehensive, (2) up-to-date and (3) unbiased information on the status of the taxon (Rylands *et al.* 2008). The previous regional action plan (Kormos & Boesch 2003) identified surveying as a key priority for the conservation of western chimpanzees. Since then, many more surveys have been conducted, including two national surveys (Sierra Leone: Brncic *et al.* 2010; Liberia: Tweh *et al.* 2015), as welll as other

WCF biomonitoring team, Guinea © WCF

large-scale surveys (for example, Campbell *et al.* 2008). As such, our understanding of western chimpanzee abundance and distribution has significantly improved. However, large-scale analyses of these data (Kühl *et al.* 2017; Heinicke *et al.* 2019a) show that gaps remain. These are in areas where no formal surveying has been conducted, where surveys are now outdated, or the methods used do not allow for abundance to be estimated (for example, Ndiaye *et al.* 2018). As data on western chimpanzee distribution and status are crucial to well-tailored conservation action, these sites need to be identified and surveyed, especially where the data gaps are in areas slated for development.

Objective 2.1: By 2025, chimpanzee distribution data gaps have been surveyed

Table 4-6. Actions for a more complete understanding of western chimpanzee distribution

Actions	Methods	Indicators	Implementers
Execution of surveys to complete our understanding of western chimpanzee distribution.	Identify locations that require formal surveying. Review temporal and ecological biases of surveys undertaken, identify potential biases. Undertake surveys and produce abundance estimates.	A.P.E.S. database is updated with field survey data and abundance estimates for all gaps identified.	IUCN SSC A.P.E.S.

Establish a baseline of cultural diversity

Chimpanzees are well known to have culture, in which different communities demonstrate different cultural norms or behavioural variants. Chimpanzee cultural variation can differ across scales, ranging from neighbouring communities (Luncz *et al.* 2012) to regions (Kühl *et al.* 2019). Most of what we know about chimpanzee culture stems from long-term research sites (see, for example, Whiten *et al.* 1999), but our understanding of the behavioural repertoire of chimpanzees grows as an increasing number of unhabituated populations are monitored. It is therefore very likely that there are undiscovered cultural variants of chimpanzee behaviours. However, behavioural diversity is likely to decline across the western chimpanzee's geographic range if it is not considered during conservation planning (Kühl *et al.* 2019). We therefore need to better understand the influence of anthropogenic pressures and preserve population-level mechanisms by which cultural capacities are supported. In order to adequately conserve behavioural diversity, a baseline of cultural diversity across the western chimpanzee's range must first be established to guide action and enhance the attention towards populations that may otherwise be considered of lower conservation value based on size and genetic diversity alone.

Young adult female chimpanzee cracking palm nuts in a recently burnt field. Bossou, Guinea © Jiles Doré/ IREB/KUPRI

Objective 2.2: By early 2022, a baseline of behavioural and cultural diversity of western chimpanzees and their conservation is established.

Table 4-7. Actions needed to establish a baseline of cultural diversity

Actions	Methods	Indicators	Implementers
Establishment of a baseline understanding of the existing behavioural and cultural characteristics of western chimpanzee populations.	Undertake a review to identify gaps of existing published and unpublished data.	Database on behavioural and cultural diversity developed; geographic ranges of selected behaviours available. Report of data gaps published.	Research organisations: MPI (PanAf and A.P.E.S.), APS, CSRS
Development of a formal protocol to include collection of information on behavioural and cultural diversity into chimpanzee field surveys.	Establish a protocol by reviewing existing methodology as part of an SGA working group.	Final protocol is available.	SGA
Identification of policies and conservation management practices into which conservation of behavioural and cultural diversity can be integrated, such as the Convention on Migratory Species, PA management plans.	List policies and conservation management activities and identifying those in which the inclusion of the conservation of behavioural and cultural diversity would have the greatest impact.	List of policies and conservation management is available.	SGA
Development of a strategy to include the protection of chimpanzee behavioural and cultural diversity into chimpanzee conservation.	Identify specific targets for the protection of behavioural and cultural diversity by a working group, which is then finalised by a stakeholder meeting.	Strategy is available.	Research organisations: MPI (PanAf and A.P.E.S.), APS, CSRS
Development of an indicator to measure progress of conservation targeted at behavioural and cultural diversity.	Develop a metric that measures the occurrence and abundance of select behavioural and cultural traits over time.	Indicator is available.	Research organisations: MPI (PanAf and A.P.E.S.), APS, CSRS

Establish a baseline of genetic diversity

Maintaining the genetic diversity of a taxon is paramount to maintaining the viability of that taxon. To this end, in addition to the conservation target of curbing population decline, we must also consider the long-term population viability of western chimpanzees through the lens of genetic diversity.

Our current understanding of western chimpanzee genetic diversity is limited, as the population history relative to other chimpanzee subspecies has been deduced using samples from captive apes (Prado-Martinez *et al.* 2013; de Manuel *et al.* 2016). Additionally, studies have mainly focused on single site analyses, thereby obscuring potential relatedness and population history. A comprehensive understanding of population genetics and genetic history in western chimpanzees would help identify populations that are genetically unique, unique alleles important for maximising genetic diversity, and may help define ideal conservation units of the subspecies. In the face of steep population declines, it would be useful to understand current genetic patterns across the western chimpanzee's range and – based on these patterns – implement a strategy to preserve diversity.

Objective 2.3: By early 2021, a preliminary baseline of genetic diversity of western chimpanzees is established

Table 4-8. Actions needed to establish a baseline for genetic diversity

Actions	Methods	Indicator	Implementers
Completion of a baseline understanding of the existing genetic characteristics of western chimpanzee populations.	Review existing data and identify gaps. Conduct targeted research to eliminate research gaps.	Report of data gaps published. Successful completion of research projects.	Research organisations: MPI (PanAf and A.P.E.S.), APS, CSRS
Development of an agreed baseline of genetic diversity in chimpanzees and creation of a targeted strategy for ensuring their continuation.	Organise a stakeholder meeting to agree upon the baseline and create a strategy.	Formal report on definition of a genetic baseline and identification of goals. Strategy for maintaining genetic diversity published and disseminated.	Research organisations: MPI (PanAf and A.P.E.S.), APS, CSRS, NGOs
Development of a formal protocol to integrate genetic sample collection in chimpanzee field surveys.	Based on existing practices, SGA to develop a formal protocol. Identify an institution for sample processing and analyses.	Protocol is available. An institution is dedicated to sample processing and analyses.	SGA, institution for genetic analyses

Eliminating gaps in conservation effectiveness

Between 2003 and 2007, at least US $3.5 million was earmarked for chimpanzee conservation actions recommended in the 2003 action plan (see Kormos 2008). However, often conservation action is not evaluated for how effectively it is achieving its conservation goals, whether they are reduction of a threat or maintaining population numbers. In primates, only 80 studies have evaluated the effectiveness of conservation activity (Junker *et al.* 2017; Petrovan *et al.* 2018), and for western chimpanzees only six evaluations of effectiveness have been formally undertaken (Neugebauer 2018). A recent survey of conservation stakeholders recorded 20 different interventions, which have been implemented 153 times across 20 sites in West Africa (ibid.). However, only a few those interventions were evaluated and provided sufficient evidence to be considered effective in meeting conservation goals.

Of the most frequent interventions implemented in the region, anti-poaching patrols and a permanent research presence were scored by conservation stakeholders as most effective with regard to perceived effectiveness (ibid.). The positive relationship between intervention cost and perceived effectiveness (the subjective evaluation of effectiveness by the implementer) indicates that more expensive interventions are more likely to be perceived as effective despite no measurable correlation between perceived and actual effectiveness (ibid.). Collectively, these results highlight a real need; first for discretion in action prioritisation based on evidence of effectiveness, and second for integrated evaluation of effectiveness as actions are implemented. To improve the efficacy of actions outlined in this plan and inform future endeavours, all conservation activities related to chimpanzee conservation should build in systems for monitoring outcomes, evaluating success, and disseminating these outcomes to donors and other practitioners.

Objective 2.4: By the end of 2022, 100% of conservation projects include a strategy for monitoring and evaluating the effectiveness of their actions.

Table 4-9. Actions needed to eliminate gaps in conservation effectiveness

Actions	Methods	Indicators	Implementers
Establishment of an adequate monitoring and evaluation framework to determine the efficacy of conservation projects for the western chimpanzee.	1. All donors require demonstration of an adequate monitoring and evaluation framework that includes the effectiveness of the project's activities.	Percentage of action-plan related conservation activities in which effectiveness evaluation plans are articulated.	1. Donors 2. Conservation practitioners: national environmental agencies, NGOs 3. Research institutions
Analysis and dissemination of the results of the effectiveness evaluation.	1. Establish a central platform on which reports that evaluate effectiveness of conservation interventions are made available. 2. Provide financial support to practitioners to publish evaluations in open-access scientific-literature. 3. Facilitate access to conservation action effectiveness evaluations for practitioners.	Number of action open-access evaluations shared.	Conservation practitioners
Best Practice guidelines on evidence-based conservation.	Document is written by SGA members.	Document is made available.	SGA

Develop a region-wide monitoring strategy

Besides evaluating effectiveness, conservation systems must incorporate monitoring schemes to evaluate the status of their conservation targets. While these two strategies overlap considerably, they operate at separate scales: conservation effectiveness evaluation occurs at the project level, while monitoring of programmes is directed at national and regional levels. It is imperative, therefore, that a system be established for consistent and systematic monitoring of chimpanzee populations using standardised methodology (see Kühl *et al.* 2008), with special consideration given to sampling the most vulnerable populations, as well as a representative sample of the region at large (across habitats, countries, protection status and population sizes). Such a system should incorporate cycles of monitoring across the representative sample and collect data on both great ape abundance and measurable indicators of threats (for example, habitat loss, hunting activity). Additional monitoring systems, such as for disease or habitat quality, can be integrated into this framework, or developed separately.

WCF field assistant wearing a face mask, Taï National Park, Côte d'Ivoire © Frederic Noy/WCF

During the workshop, attendees identified a specific need to establish chimpanzee-trafficking baselines, as a means by which future trafficking patterns can be evaluated. Such systems can be integrated into other monitoring frameworks. Cross-sectorial efforts should be made to ensure that actions undertaken in this plan are socially-appropriate and involve relevant local, governmental and regional stakeholders, and are integrated in a manner that will maximise their likelihood of success amongst the public and capitalise upon aspects of social norms and practice (for example, hunting taboos: Boesch *et al.* 2017b; Heinicke *et al.* 2019b), which inherently imbed chimpanzee conservation in daily life. Beliefs, perceptions and socially-appropriate avenues for conservation integration must be identified and established beforehand. Lastly, all monitoring activities would ideally be integrated into a central database (such as A.P.E.S.) and systematically analysed to monitor changes across the region.

Objective 2.5: By 2021, a set of regional indicators is created and agreed to enable chimpanzee conservation progress to be measured over time.

Objective 2.6: Beginning in 2021, a region-wide assessment of chimpanzee population status, threat levels and other identified indicators is measured and analysed at regular intervals.

Objective 2.7: By mid-2021, a preliminary baseline understanding concerning international trade of western chimpanzee infants and body parts is established.

Objective 2.8: By 2024, a cross-disciplinary approach is created to guide all relevant chimpanzee conservation strategies on how to be socially appropriate and maximise public participation.

Table 4-10. Actions needed to develop a region-wide monitoring strategy

Actions	Methods	Indicators	Implementers
Development of an indicator to measure progress in western chimpanzee conservation.	Provide information on abundance, trends, threats, behavioural and cultural diversity, trade, funding, effectiveness, and so on, to create a set of indicators allowing measurement of progress over time.	Indicator available.	Collaboration between researchers and conservation practitioners, NGOs
Design and implementation of a regional monitoring scheme to assess chimpanzee status.	In collaboration with stakeholders, including private sector, design and approve a protocol for population monitoring. Conduct abundance surveys at 3-year intervals.	Defined survey methodology/protocol.	A.P.E.S. database, consortium of researchers, NGOs, relevant government authorities, IFC and private industries
Centralisation of monitoring data in a database.	Deposit monitoring data in A.P.E.S. database.	Number of datasets in A.P.E.S. repository.	A.P.E.S. database
Analysis of rates of population change across monitoring stations.	Replicate the analysis by Kühl *et al.* (2017).	Reports one year following campaigns.	A.P.E.S. database, researchers
Tracking and consolidation of information on trafficking of chimpanzees originating from West Africa.	Create a regional platform for information sharing on chimpanzee trafficking.	Quantitative baseline on number of western chimpanzees trafficked regionally and intercontinentally.	Law enforcement agencies, EAGLE Network, PASA, GRASP database
Identification of avenues for incorporating local ecological knowledge and protective beliefs into conservation strategy.	1. Identify relevant local ecological knowledge and protective beliefs across the region. 2. Identify avenues for incorporating these aspects into conservation action. 3. Evaluate the effectiveness of social beliefs in protecting chimpanzees.	1. Working paper identifying relevant local ecological knowledge and beliefs and detailing potential avenues for integration into conservation action. 2. Scientific publication evaluating effectiveness of social beliefs in contributing to chimpanzee conservation.	Collaboration between social scientists and conservation practitioners, NGOs

Strategy 3: Policy development and legal framework review

Policy development and review are critical to law enforcement efforts and coherence in legal texts pertaining to chimpanzees, as well as national-level legislation when it comes to ESIA requirements and legal frameworks surrounding the regulation of artisanal mining. The section below addresses critical steps in the review of legal texts, incoherency and gaps to yield recommendations for effective legal reform.

Review of national and regional legal texts pertaining to western chimpanzees, ESIAs and artisanal mining

Legal frameworks regulating how countries manage their wildlife, particularly chimpanzees, are vast and highly complex. They encompass much more than the obvious environmental and wildlife protection laws, extending into multiple legal areas including criminal, forestry, animal health, land use, transportation, international trade, finance, taxation, and business (tourism, manufacture, etc.) to mention just some of them. These legal frameworks, across many jurisdictions, are far from providing coherent and comprehensive support to wildlife conservation goals.

Understanding the status of legislation in the jurisdictions western chimpanzees inhabit is a preliminary requirement of any effort to enhance the legal frameworks affecting them. A baseline study tells us "what we have" in place. The Legis-Ape project, implemented by Legal Atlas in 2018, provided some of this analysis through the compilation and review of legal frameworks related to great apes for three of the eight western chimpanzee habitat countries (Côte d'Ivoire, Guinea, Liberia; Rodriguez *et al.* 2018). These sets of laws need to be expanded to cover also land management legislation, which is not part of Legis-Ape's scope. For the remaining countries (Ghana, Guinea-Bissau, Mali, Senegal and Sierra Leone), research is required to determine what legislation currently exists at the international (treaties and agreements), national (government policies, legislative acts, resolutions from the prime minister), and regional/local (ministerial decrees) levels, which directly or indirectly regulate the subject.

Objective 3.1: By early 2021, a review of national legal frameworks related to western chimpanzees has been completed, including ESIA requirements and artisanal mining.

Table 4-11. Actions needed to review national and regional legal text pertaining to western chimpanzees, ESIAs and artisanal mining

Actions	Methods	Indicators	Implementers
Compilation and analysis of national legislation and regulation in all areas that impact chimpanzee conservation, including ESIA requirements and artisanal mining.	Review legal frameworks to map institutional arrangements, offenses and penalties, permitting processes, enforcement powers and authorities and other key elements pertaining to chimpanzees.	Review completed and country reports produced.	Legal Atlas, NGOs, field organisations

Identification of gaps in national and regional legislation

Identifying gaps in national and regional legislation will provide the necessary inputs to design legal agendas to enhance current legal frameworks in favour of chimpanzee conservation. A comparison between conservation needs against existing law and practice allows for the identification of potential gaps, conflicts and overlap. Gaps arise when there is no law or regulation, no implementation, inadequate law or regulation, inadequate implementation, or some combination thereof. Conflicts include either conflicting law or regulation (can conflict with either a stated management need or an existing law), or conflicting implementation (includes deliberate commissions or omissions which directly conflict with stated needs or existing laws). Overlaps occur where a given geographical area, subject, or resource is managed by separate entities and for which lead agency or other mechanisms are not sufficiently clear to determine which entity has the authority to act or what forms of cooperation and collaboration are required.

Objective 3.2: By 2022, GAP analyses of the laws impacting western chimpanzee conservation are published for each country.

Table 4-12. Actions needed for the identification of gaps in national and regional legislation

Actions	Methods	Indicators	Implementers
Identification of gaps in laws, regulations and policies needed in each of the eight habitat countries to ensure an adequate legal framework to protect chimpanzee populations.	Literature review, round tables, workshops, interviews.	Eight national legal gap analyses.	Resource specialists, governmental managers, Legal Atlas (whose teams include local attorneys), stakeholders

Enhancement of legal frameworks laws pertaining to western chimpanzees, ESIAs and artisanal mining

Where appropriate, recommendations will include the preparation of wording to amend specific articles and provisions. It may also involve the drafting of completely new legal documents missing in the country (for example, concerning reintroduction to nature after seizure). Legal drafting requires legal understanding of basic constitutional, administrative and criminal law in the country to ensure that the proposals have a good fit within the national legislation. It is also important to leverage at this point international legal best practices and the experience of other jurisdictions. Once a draft proposal is created, a validation process with key stakeholders who participated in the needs assessment will be conducted.

Final proposals will compile all the legal reforms that can be proposed in each country to ensure the conservation and welfare of chimpanzees. These will become technical instruments to properly equip stakeholders in their efforts to pursue legal reforms. An educational action is thus necessary with stakeholders for the community to become familiar with the nature of the reforms proposed. In the end, the legislative and executive powers are the ones ultimately responsible for approving changes in legislation. With this action, the project will facilitate reforms by putting in the hands of well-informed stakeholders a set of sound, comprehensive and ready to use legal materials. It is anticipated that legal reforms will be conducted by national authorities during the remaining period of the project timeline.

Objective 3.3: By early 2023, formal proposals for legal reforms exist and are promoted by relevant government stakeholders.

Table 4-13. Action needed to improve the legal framework

Actions	Methods	Indicators	Implementers
Production and dissemination of a report of proposals of new laws, regulations and policies to reform the legal framework to benefit chimpanzee conservation.	Workshops, legal review, legal analysis, legal drafting, validation with key stakeholders.	Report containing the specific proposals for legal reform for each of the eight countries.	Legal Atlas

Strategy 4: Regional coordination to address illegal chimpanzee trade

Effective application of wildlife law requires coordination among a range of international, national and local actors. Authorities need a sufficient level of capacity to adequately enforce national laws, identify trafficking routes and coordinate international law enforcement operations. Sanctuaries, i.e. government or non-governmental facilities the main function of which is to recover confiscated chimpanzees from the pet trade and ensure their rehabilitation and life-long care, play a vital role in the application of wildlife law by facilitating confiscations. By partnering with agencies responsible for law enforcement and providing appropriate facilities to house confiscated chimpanzees, sanctuaries enable the arrest of individuals involved in the illicit wildlife trade, ensuring the proper placement and care of illegally-held and traded chimpanzees.

Regional coordination of law enforcement

There is growing recognition that it is necessary to stimulate behaviour change to increase coordination among national, regional and international partners in broad-based strategies to tackle illegal trafficking of chimpanzees, as well as to strengthen law enforcement, including prosecutions with appropriate minimum sanctions (Rodriguez *et al.* 2018). Similarly, behaviour change is needed among consumers in urban areas to reduce the demand for bushmeat, and in rural communities living alongside chimpanzees to minimise the risk of capture events. Sanctuaries can enhance public awareness of the

laws protecting chimpanzees and about their conservation.

Objective 4.1: By 2021, identify gaps in enforcement and public awareness that can readily be addressed.

Objective 4.2: By 2022, produce a comprehensive report of priority areas in western chimpanzee habitat countries, overlaid with maps documenting hotspots of poaching and capture of chimpanzees, and trafficking routes. Ports and border crossings commonly used for trafficking will also be highlighted on these maps.

Objective 4.3: By 2022, collaboratively develop and implement a multi-year, cross-border action plan aimed at ending illegal capture and trafficking of chimpanzees.

Objective 4.4: By 2023, develop and implement a capacity strengthening strategy to improve the effectiveness of officials in wildlife law enforcement, particularly in under-resourced areas such as land border crossings and seaports.

Table 4-14. Actions needed for regional coordination of law enforcement

Actions	Methods	Indicators	Implementers
Creation of an actionable, realistic plan to reduce the chimpanzee trade, including strengthening law enforcement, facilitating prosecution and increasing public awareness.	Convene a workshop of relevant law enforcement agencies and NGOs to develop an action plan.	An action plan on law enforcement aimed at eliminating illegal trade in chimpanzees.	All relevant governmental agencies, national and international organisations, NGO partners, including sanctuaries, and expert input on capacity strengthening and behaviour change
Strengthen communication and collaboration of law enforcement activities between all actors involved in preventing illegal trade in chimpanzees.	Secure Memoranda of Understanding (MoUs) between law enforcement agencies of all western chimpanzee range countries, sanctuaries, relevant national and international agencies, EAGLE Network.	Effective and dynamic working groups that will strengthen information exchange and law enforcement, and increase public awareness regarding wildlife trafficking – in place and active.	All relevant governmental agencies, national and international organisations, relevant NGOs, PASA and sanctuaries
Development and implementation of law enforcement capacity strengthening strategy for relevant officials in western chimpanzee range countries including training, job exchange, shadowing, mentoring.	1. Expert to develop a capacity needs assessment and associated strategy. 2. Implementation of capacity strengthening strategy.	Number of participants ensuring representation of judiciary, and all relevant land border crossing and seaport officials across the region.	Relevant national agencies, relevant law enforcement experts, sanctuaries, EAGLE Network, USFWS Office of Law Enforcement

Chimpanzee kept on a chain as a 'household pet' in Côte d'Ivoire © WCF

Regional coordination for chimpanzee confiscation and placement

To strengthen the ability of national agencies to enforce the law, it has become critical to facilitate chimpanzee confiscation and efficient placement at in-country accredited sanctuaries (Côte d'Ivoire, Guinea, Liberia, Sierra Leone), as well as in adjacent countries when there is no national accredited sanctuary. To achieve this, accredited sanctuaries in the region need to have adequate quarantine and holding facilities to support ongoing confiscation efforts. If a range state has no accredited sanctuary, it will need an appropriate transit facility to provide short-term care. Then agreements and protocols need to be established to facilitate the placement and transfer of confiscated individuals to accredited sanctuaries in neighbouring countries. Such endeavours will require cooperation and communication between various stakeholders, including national law enforcement agencies, CITES authorities, the EAGLE Network (specifically Guinée-Application de la Loi Faunique or GALF), and chimpanzee sanctuaries (PASA members, plus Akatia in Côte d'Ivoire and LCRP in Liberia).

Objective 4.5: By 2024, 80% of all existing range state and PASA-member sanctuaries in West Africa are prepared, equipped and staffed adequately to effectively handle confiscated chimpanzees while ensuring high standards of welfare and wellbeing of all chimpanzees in their care.

Objective 4.6: By 2026, effective MOUs or protocols for the placement of confiscated chimpanzees are in place and communicated to all relevant parties across all western chimpanzee range countries.

Table 4-15. Actions needed for regional coordination of chimpanzee confiscation and placement

Actions	Methods	Indicators	Implementers
Enhancement of quarantine and holding capacities of existing sanctuaries in range states (PASA members, plus Akatia and LCRP).	Carry out a needs assessment and expansion or rehabilitation of current facilities.	Quarantine and holding facilities of sanctuaries in West Africa have been improved to benefit the welfare of confiscated chimpanzees, including housing chimpanzees from neighbouring countries, such as Guinea-Bissau.	Sanctuaries (PASA members, plus Akatia and LCRP)
Production of MOUs or protocols to help facilitate effective action and ensure the welfare of confiscated individuals	Draft MOUs or protocols based on a consultative process among relevant parties.	Number of signed MOUs or agreed protocols in place.	Sanctuaries (PASA members, plus Akatia and LCRP), national law enforcement agencies and relevant NGOs, including CITES
Communication of protocols in place to all relevant parties.	Email and web platforms.	All relevant parties are aware of existing protocols.	Sanctuaries (PASA members, plus Akatia and LCRP), national law enforcement agencies and CITES

Orphaned chimpanzee being kept illegally as a 'pet' in a remote region of Liberia © LCRP

Strategy 5: Disease monitoring and the One Health model

Box IV: What is One Health?

One Health (www.onehealthglobal.net) is a comprehensive approach to human and animal health that focuses on: (a) improving health and wellbeing of humans and other animals through risk mitigation, including reducing the effects of disease that originates at the interface among people, wildlife, domestic animals and their various environments; and (b) promoting cross-sectoral collaboration and a 'whole of society' treatment of health hazards, as a systematic change of perspective in the management of risk. Such endeavours will only work by recognising and taking into account cultural and socioeconomic drivers of pathogen transmission in an ecosystem, including issues such as tourism and political stability.

The premise of One Health is that people, animals and the environment form an interdependent ecosystem that needs to be considered in a coordinated manner. Thus, it involves the collaborative efforts of multiple health science professionals, together with their related disciplines and institutions – working locally, nationally and globally – to attain optimal health for people, domestic animals, wildlife, plants and the environment. Conservation medicine is the branch of One Health that focuses on disease risk mitigation from the point of view of wildlife.

The **Global Health Security Agenda** (GHSA) is a consortium formed in 2014 that includes the World Health Organisation, the World Organisation for Animal Health, the Food and Agriculture Organisation, and multiple national governments. Their vision is 'a world safe and secure from infectious disease threats'. The GHSA dictates that all future disease risk mitigation in wildlife populations must take One Health into consideration (https://www.ghsagenda.org/). Any One Health programme risk communications matrix should co-ordinate with the GHSA, as they will soon be actively seeking out those involved in chimpanzee protection.

Disease Risk Analysis (DRA) provides a number of tools for cost effective data gathering and to communicate a disease situation to all stakeholders to better ensure an accurate representation of disease in a holistic One Health manner. Refer to the Guidelines for Wildlife Disease Risk Analysis (IUCN & OIE 2014).

Most western chimpanzees live in human-altered landscapes, making their populations vulnerable to emerging disease at the wildlife-human interface, especially to pathogens of human origin (see Gilardi *et al.* 2015). Disease risks underlie the rationale for a One Health approach to chimpanzee conservation and provide an imperative for enhanced disease surveillance as an integral component of conservation management.

Unfortunately, there is a paucity of data to quantify ongoing disease threats to chimpanzee populations caused by contact between animals and people, despite documentation of disease transfer in human-dominated habitats. A review of current knowledge of EVD epidemiology in great apes by Leendertz *et al.* (2017) can serve as a template for a complete description of the issues, state of knowledge and current data gaps in chimpanzee health as a first step in a disease risk assessment.

To rectify these data gaps and address potential disease risks in western chimpanzees, vital will be the development of field staff capacity in disease surveillance techniques, including technical expertise in non-invasive diagnostics and monitoring in great apes. Policy makers and the general public must be made aware of the risks of disease transfer between humans and apes and the implications this has for human and environmental health. It is essential to create enabling conditions, including strong governance to equip point people for an efficient disease response system.

Chimpanzees cooling down in a pool of water, Fongoli, Senegal © Erin Wessling

Objective 5.1: By early 2021, a risk communication matrix of identified point people is formed for western chimpanzee health in West Africa.

Currently, if a disease outbreak or death in a western chimpanzee community is recorded, there is no clear communication or technical network to quickly and efficiently react to this situation in a safe and appropriate manner. Table 4-16 proposes actions and recommendations as a first step in the process. This process must include an evaluation to confirm the understanding by all pre-identified point people of their role in risk mitigation, from a point person on the ground identifying the index case in an outbreak to policymakers introducing protocols to minimise disease impacts on chimpanzee and human populations alike.

Table 4-16. Actions needed to develop a risk communication matrix

Actions	Methods	Indicators	Implementers
Creation of a risk communication matrix of point people with a phased workplan to respond to disease outbreaks.	Create a risk communication matrix.	Risk communication matrix created.	CPSG with support from health experts
Test the system – from disease detection to public press statement. Training to be provided annually to working groups, including scenario work-through, taking into account changing capacity by range country.	Run outbreak situations as drills to make sure the network functions as it should before it is needed.	Successful and timely resolution of an imagined outbreak scenario.	CPSG with support from health experts and working groups
When disease outbreaks occur, an appropriate, rapid response is well coordinated and effective in addressing the contagion.	Implement risk communication matrix.	Risk communication matrix implemented.	CPSG with support from health experts and working groups

A small village in a chimpanzee stronghold, Senegal © Erin Wessling

Objective 5.2: By early 2022, risk analysis of the current status of western chimpanzee diseases is completed, and by early 2023 a programme of disease risk mitigation is implemented.

The first step in preparing for a risk analysis is to accurately describe the problem. A problem statement covers the specific question for analysis and the type of risk analysis required. Once the problem description is confirmed and a communications network has been set up, those involved are well placed to begin the risk analysis process of hazard identification, risk assessment, management (including disease surveillance), implementation and process review. With this system in place (Table 4-16), it is possible to be confident that One Health issues in western chimpanzees, including disease surveillance, will be:

- undertaken on a clear cost-benefit basis
- evidence based
- able to identify data gaps; and
- clearly communicated to all stakeholders.

Table 4-17. Actions needed for the implementation of a Disease Risk Assessment (DRA) process for western chimpanzees

Actions	Methods	Indicators	Implementers
Creation of a disease risk strategy that pre-identified point people agree to implement.	Organise DRA workshop – output confirmed problem description, completion of the risk communication matrix and the beginning of a risk assessment.	Practitioners/project managers trained and evaluated as proficient in DRA techniques. Accurate, evidence-based assessment of disease risk achieved.	CPSG assisted by a working group
Development of the disease surveillance and risk management capacities of range country point people.	Training in biosecurity/ disease investigation. Investment in local hubs for diagnostics.	Practitioners/project managers trained and evaluated in techniques and ability to train others.	Working groups
Creation of an easily-searchable database with historical data and ongoing data gathering on chimpanzee disease findings and epidemiology.	Cloud based, secure storage of information gathered (see use of 'Canvas' by University of Minnesota, PASA, or EID II at University of Liverpool (https://eid2.liverpool.ac.uk/) plus sample bank.	Future outbreaks are minimised thanks to knowledge gained by surveillance of chimpanzee populations.	Working groups
Testing of the risk strategy system with accurate disease surveillance and update the disease risk model.	Use the network developed as per objective 5.1. Monitor disease successfully by increasing local capacity to increase diagnostic capacity in-country and, when international sample shipment is needed, this runs smoothly.	Successful communication (including publishing) and accurate data collection of disease status in chimpanzee populations.	Working groups
Testing of the risk strategy system in the face of a real outbreak.	Use the network of point people developed, to successfully manage disease outbreak.	Successful communication and resolution of disease outbreak with minimal chimpanzee mortality.	Working groups

Strategy 6: Land-use planning (LUP)

Until now, western chimpanzees have rarely been considered in LUP processes, at either theoretical or practical levels. The overlap of the western chimpanzee's geographic range with proposed development corridors (Laurance *et al.* 2015) demonstrates the considerable potential costs to chimpanzees – 10% of the population lives within 25 km of one of the four proposed (Heinicke *et al.* 2019a; and see Figure 3, p.18).

In addition, in Côte d'Ivoire, Ghana, Liberia and Sierra Leone, in particular, there is extensive overlap between areas with suitable environmental conditions for chimpanzees (defined by Junker *et al.* 2012) and areas suitable for agricultural development, such as oil palm plantations (Wich *et al.* 2014). Furthermore, even when the needs of chimpanzees are considered, this is through environmental and social impact assessments (ESIAs) on a project-by-project basis, and the cumulative impacts these projects impose upon chimpanzees are typically ignored.

There is, therefore, an urgent need to integrate chimpanzee conservation at a variety of scales. This will involve three levels of planning (Lanjouw 2014): strategic environmental assessments (SEAs), systematic conservation planning (SCP), and mitigation and offsets. The first section of this strategy presents actions specifically concerning the first two levels, and the second section addresses mitigation and offsets. It is of paramount importance that the conservation community gets involved at the earliest stage possible of potential SEAs to ensure avoidance of chimpanzee habitats being affected at the outset.

Integrating SEAs into LUP to ensure that cumulative impacts of projects are considered

A regional framework by which the cumulative impacts of industrial projects are evaluated is necessary to ensure that mitigation occurs at the scale needed. No-go zones should be identified and acknowledged by national governments, and their protection enforced (Kormos *et al.* 2014). Outside these no-go zones, the cumulative impacts on chimpanzees must be accounted for. Certainly, if ESIAs are performed on a project-by-project basis, the cumulative impacts of projects in chimpanzee habitat need to be evaluated. One prominent tool for the accounting of such impacts is the establishment of SEAs (Lanjouw 2014). SEAs are high-level decision-making procedures, best initiated by governments, and which typically operate at landscape or regional scales (ibid.). The purpose of an SEA is to promote sustainable development across the scale of reference, and to provide a guiding framework from which governments, lenders and the private sector can orient themselves from a set of policies and standards of development across the landscape (ibid.). Such exercises provide a clear framework within which the private sector can operate, and may help define the aforementioned 'no-go zones' or guide offset design processes (Kormos *et al.* 2014), and would at least provide a larger framework with which ESIAs must also comply and evaluate their impacts beyond direct project boundaries.

Objective 6.1: By 2028, all national governments have articulated and implemented national SEAs that include consideration of chimpanzees.

Objective 6.2: By 2029, a range-wide SEA including chimpanzees is articulated and national LUPs of each range state are updated accordingly.

Table 4-18. Actions needed for the integration of conservation planning into LUP across sectors and SEAs

Actions	Methods	Indicators	Implementers
Governments require SEAs and incorporate these into LUP activities.	Policy review, lobbying.	Government policy in place to require SEA.	Governments, NGOs, CSOs, SGA, GRASP
Lobbying multilateral lenders to require cumulative impact assessments (e.g., IFC, International Monetary Fund, World Bank).	Policy review, lobbying.	Donor policy in place.	Governments, NGOs, CSOs, SGA, GRASP
Advocate for existing and future SEAs to integrate chimpanzee issues.	Lobbying funding bodies to support national-level SEA development.	SEA for each range state.	Governments, NGOs, CSOs, SGA, GRASP

Integration of conservation planning into LUP across sectors and SEAs

Consideration of the impacts of land conversion is typically prioritised towards human development and rights, and economic costs over the impacts (direct and cumulative) to chimpanzees.

Why chimpanzee needs are frequently excluded in LUP may have a number of explanations:

- A perceived lack of data to inform LUP processes by planners
- Not enough political or economic interest to consider the impacts upon chimpanzees
- The cumulative impacts of various LUP projects are not coordinated in regional or national level plans
- Conservation planning often does not involve other sectors, so plans are not used by the agencies and/or political levels where decisions on land use are taken.

We can address these issues one-by-one, but they demonstrate the necessity of ensuring that chimpanzee conservation needs are directly incorporated into LUP structures and of shifting motivations towards considering chimpanzees in these processes. Certainly, there is no lack of data available to inform LUPs – chimpanzee presence is well established for much of West Africa, even if fine-level details are patchy for some areas. Rather, it is imperative to make stakeholders aware that these data exist, especially the governments who initiate and oversee LUP processes, and ensure that these data are accessible to them.

Multiple approaches are available to improve the integration of chimpanzee populations into LUP. These include requiring the involvement of chimpanzee experts in LUP processes, or by disseminating documents on direct impacts of land conversion threats, chimpanzee status and other relevant background information to stakeholders involved in LUP. This additionally requires the incorporation of systematic conservation planning (SCP) into LUP, to allow the application of available data for informing LUP processes at a variety of scales. SCP is a process of understanding threats, drivers of loss, and impacts of various planning scenarios to conservation goals. These activities would allow planners to make better informed decisions. As a result, all groups are able to identify scenarios that maximise the goals of their own interest, as well as options for chimpanzee-friendly development. Scenario planning should, therefore, occur across the range of scales at which it is relevant, meaning national scenarios should also be coordinated at regional scales.

Chimpanzees feeding on cultivated papaya and pineapple fruits. Bossou, Guinea © Susana Carvalho

Objective 6.3: By 2026, chimpanzee experts are involved in 100% of LUP exercises performed in the region.

Objective 6.4: By 2023, all regional LUP agencies are aware of the status of chimpanzees in their operating framework and of local drivers of decline.

Objective 6.5: By the end of 2024, Guinea, Liberia and Sierra Leone have performed national-level SCP, including future scenario evaluation of impacts on chimpanzees, and definition of conservation goals.

Objective 6.6: By 2026, SCP results have been incorporated by the governments of Guinea, Liberia and Sierra Leone into national and local LUP outputs.

Objective 6.7: By 2028, all eight western chimpanzee range countries have performed national-level SCP, including threat impacts and future scenario evaluation for chimpanzees, and the definition of conservation goals.

Objective 6.8: By 2027, SCP results from Guinea, Liberia and Sierra Leone are coordinated across the three adjacent countries.

Table 4-18 (cont.). Actions needed for the integration of conservation planning into LUP across sectors and SEAs

Actions	Methods	Indicators	Implementers
Conduct a horizon scanning exercise to identify ongoing and future LUP efforts and compile a detailed overview of each country's LUP process, including any SCPs and SEAs.	Expert hired and report produced that details existing and future LUP efforts, SCP efforts and SEAs.	Report written and disseminated.	NGOs, IFC, relevant government agencies
Make chimpanzee status and distribution data available to land-use planners in a format that is accessible and understandable to them, prior to the planning process.	Distribute a white paper on chimpanzee populations and their distribution; develop a GIS data layer for A.P.E.S. database and and for the Integrated Biodiversity Assessment Tool (IBAT) for Business.	100% of LUP agencies in possession of the white paper. IBAT includes data layer on chimpanzee status and distribution.	NGOs
Include consideration of chimpanzee conservation in LUP activities, and involve chimpanzee experts in the process.	1. Funders require involvement of chimpanzee experts in LUP applications. 2. SGA develops a list of chimpanzee experts for each range state. 3. Governments request SGA expert input before LUP is approved.	50% of LUP processes involve chimpanzee experts.	1. Funders 2. SGA 3. Range state governments
Production of SCPs for chimpanzees for all eight countries, ensuring results are coordinated between Guinea, Liberia and Sierra Leone.	Hold a workshop involving planning experts from each country to review existing LUP activities and develop recommendations for national level SCPs.	SCPs produced.	Governments, NGOs, researchers, private industries
Ensure that stakeholders, including range-state governments, ratify LUPs.	1. Disseminate results of SCPs to government organisations relevant to LUP for incorporation into LUPs. 2. Coordinate with governmental authorities for revision of LUPs to account for SCPs, if relevant.	LUPs incorporated cultural and genetic diversity are ratified by governments.	Governments

Participation of great ape experts in LUP processes across sectors and SEAs

To ensure that ESIAs evaluate impacts and actions appropriately, oversight and involvement by chimpanzee experts is essential. After impact is evaluated, there must be follow-up on action by industry to minimise, mitigate and/or offset negative impacts – and there must be ways of penalising those who do not implement their proposals.

Objective 6.9: Starting in 2020, participation of chimpanzee experts is required in all LUP exercises and any other activities requiring an ESIA by governments.

Objective 6.10: Starting in 2020, all LUP exercises and activities requiring an ESIA by governments involve chimpanzee experts in formal follow-up evaluation of impacts on chimpanzees.

Objective 6.11: By 2024, 100% of industrial projects in West Africa adequately implement ESIAs with ARRC Task Force approval.

Table 4-18 (cont.). Actions needed for the integration of conservation planning into LUP across sectors and SEAs

Actions	Methods	Indicators	Implementers
Advocate governments to require ESIAs before onset of activities (including exploration) for any development activity and include review by SGA chimpanzee experts before project approval.	Policy review, lobbying.	1. Government policy in place. 2. ESIAs are submitted to governments prior to all activity.	Governments, NGOs, CSOs, SGA, GRASP
Development of an objective and transparent process by which chimpanzee expertise is provided to development projects.	ARRC Task Force finalises process.	Process documented and available on ARRC webpage.	SGA
Advocate that governments have explicit policies to adequately regulate avoidance, mitigation and follow-through on ESIA processes.	Policy review, lobbying.	1. Chimpanzee expert involvement in follow-through review. 2. Penalisation of offenders who do not adequately follow ESIA process. 3. Campaigns to create awareness of unacceptable projects conducted.	Governments, SGA, GRASP, NGOs

Local communities with WCF staff during a land-use and mapping study for the creation of the Moyen-Bafing National Park in Guinea © WCF

Incorporating artisanal and small-scale mining (ASM) into LUP as a form of land use

Due to the informal nature of artisanal mining, it is often overlooked as a land-use type in formal LUP processes. ASM activities are unlikely to cease, therefore it is imperative that these activities be incorporated into LUP to account for local ASM needs while simultaneously minimising the environmental impact of these activities.

Objective 6.12: Starting in 2020, all formalised LUPs incorporate artisanal mining as a form of land use.

Objective 6.13: By 2023, macro-zoning plans exist for 100% of PAs to eliminate illegal extraction in PAs, which encourage ASM extraction in chimpanzee-friendly locations elsewhere.

Protected area macro-zoning involves LUP not only of the area within the defined limits of a PA, but also the land within a defined distance to the PA. This process allows for consideration of the impacts of surrounding land-use types upon a PA, and contextualises a PA in the economic, logistic and land-use situations that contribute to its success.

Table 4-18 (cont.). Actions needed for the integration of conservation planning into LUP across sectors and SEAs

Actions	Methods	Indicators	Implementers
Incorporation of artisanal mining into formalised LUP and engage with this sector to discourage activity in PAs and other environmentally sensitive areas.	1. Engage with relevant leaders of these informal communities. Include artisanal mining as land use in all LUP activities. 2. Create macro-zoning LUPs for all PAs harbouring chimpanzees. 3. Coordinate with leaders of ASM communities and relevant organisations.	Number of LUPs that include artisanal mining as a form of land use.	Land-use agencies, artisanal mining representatives, government agencies that regulate mining

Incorporating chimpanzee culture and genetic diversity in LUP

The addition of culture and genetic diversity as conservation targets for western chimpanzees should encourage their incorporation into LUP processes.

Objective 6.14: By the end of 2028, an integrated land-use and chimpanzee population management plan incorporating cultural and genetic diversity is adopted by range states.

Objective 6.15: By 2021, 40% of existing regional multi-sectorial decision-making platforms (MSPs) contribute to strengthening the coordination of western chimpanzee conservation across range states.

Objective 6.16: By the end of 2021, stakeholders have engaged with or established regional platforms that incorporate chimpanzee cultural and genetic diversity into their planning.

Table 4-18 (cont.). Actions needed for the integration of conservation planning into LUP across sectors and SEAs

Actions	Methods	Indicators	Implementers
Development of a standard approach for incorporating cultural and genetic diversity of chimpanzees into LUP that include the different stakeholder sectors.	Initiate stakeholder dialogue to develop standard approach.	Report providing recommendations for incorporating genetic and cultural chimpanzee diversity into LUP exercises.	GRASP, WA-BiCC, Manu River Union, government representatives, NGOs

Alignment of offset strategies with biodiversity conservation plans

Offsetting is the final step of the mitigation hierarchy and should be used as a last resort. However, given that it is impossible for many projects to avoid and minimise all their impacts, and that offsetting is part of a set of best practice principles, an increasing number of biodiversity offsets is expected in the coming years. Reference to offsetting and/or compensation of project residual impacts has been included in the legislation of several western chimpanzee habitat countries, including Ghana, Guinea and Senegal.

Most countries in the western chimpanzee's range have a national biodiversity strategy, but conservation priorities are not

always clearly defined in these strategies and sometimes they are based on outdated information. There is, therefore, an urgent need to identify chimpanzee priority conservation sites, define no-go areas and ensure the conservation of priority chimpanzee populations. When conducting SCPs and regional LUPs, chimpanzees can be used as umbrella species and their inclusion should be promoted whenever possible.

Heinicke *et al.* (2019c) identified important conservation areas for western chimpanzees, so it should be easier for future industrial development projects to avoid these areas in the first instance, and then to support their conservation through their offset mechanism. Other aspects of offsetting will need to be clarified to ensure these are successful, including governance, funding mechanisms (for example, through a centralised conservation fund), and how to guarantee that these areas will be funded in perpetuity (see Strategy 9: Conservation Financing).

Objective 6.17: By 2029, all western chimpanzee range countries have developed and are implementing a national offset strategy that incorporates systematic conservation planning for chimpanzees and biodiversity.

Table 4-19. Actions for alignment of offset strategies with biodiversity conservation plans

Actions	Methods	Indicators	Implementers
Development of a feasibility study and accompanying strategy for establishing the governing structures to create national offset strategies.	Hire expert and convene a workshop bringing together experts from all eight countries to develop strategy.	Strategy completed and implemented.	Government agencies and international experts
Implementation of offset operations in line with national offset strategies as soon as residual impacts on chimpanzees have been identified and cannot be further avoided or reduced.	Capacity to implement offset strategy in place and national governments in collaboration with lending banks and NGOs are carrying out strategies.	Number of offset strategies aligning with national offset plans for chimpanzees.	Economic operators responsible for impacts on chimpanzees, technical service providers and partners

Inauguration ceremony of Grebo-Krahn National Park and Gola Forest National Park in Liberia, 2018 © WCF

Strategy 7: Maintenance, strengthening and establishment of protected areas

Protected areas (PAs) are critical for the protection of chimpanzees and their habitat. However, despite the creation of several new national parks in recent years (Boé, Dulombi, Gola, Grebo-Kahn and Moyen-Bafing), only about 17% of the present population of western chimpanzees reside in high-level PAs (Heinicke *et al.* 2019a). Historically, PAs in West Africa have served largely as islands of biodiversity sheltered from the wave of habitat destruction blanketing the region, and frequently serve as the last vestiges of chimpanzee persistence while habitat is lost around them (Junker *et al.* 2012). Côte d'Ivoire is a pointed example. Amidst a 50% human population increase, the country lost most of its natural habitat and chimpanzees, few of which are now occur outside national parks (Campbell *et al.* 2008). The positive effects that PA status has on chimpanzee populations can spill over to other species. Chimpanzee abundance in Liberia, for example, is highly correlated with other large mammal abundances and tree diversity (Junker *et al.* 2015b). Protection of chimpanzees via PA status, therefore, can have umbrella effects on biodiversity at large, thus cementing their significance as a valuable flagship species for biodiversity in the region.

However, the integrity of the ecosystems in PAs is increasingly under threat. Common threats to western chimpanzees, such as poaching and habitat loss, also plague PAs. The PAs of West Africa have been rated as suffering the highest degrees of various threats to PAs across Africa (Tranquilli *et al.* 2014). Greengrass (2016) demonstrated that, despite its protected status, wildlife in Sapo National Park is under considerable poaching pressure due to the bushmeat trade, and that this pressure extends to the vulnerable chimpanzee population. To add to this, many PAs in the region are earmarked for mining or other infrastructure development (Junker *et al.* 2015b; Heinicke *et al.* 2019a). The Koukoutamba hydroelectric dam, for example, is slated to be built in the middle of the Moyen Bafing National Park in Guinea, which could kill up to one-third of the resident chimpanzees.

The creation of PAs has long been considered to be the most effective conservation strategy by chimpanzee conservationists working in West Africa (Neugebauer 2018). However, the effectiveness of PA creation is high only when PAs are well funded and well managed. 'Paper parks' in which little conservation activity occurs, that are poorly funded and poorly managed, are ineffective (Tranquilli *et al.* 2014). It is, therefore, important to support activities in PAs that perform well and are proven effective, as well as to establish locally appropriate systems where current coverage does not suffice. The following are the objectives for this strategy.

WCF community ecoguards, Grebo-Krahn National Park, Liberia © WCF

Establishment of new PAs to ensure adequate coverage of chimpanzee populations

Relative to other regions, PA coverage in West Africa is relatively sparse and has yet to meet Aichi Biodiversity Targets (Kühl *et al.* 2017). As such, only ~17% (Heinicke *et al.* 2019a) of the estimated total number of western chimpanzees occur in IUCN PA levels I and II, leaving the vast majority of the population unprotected. At the national level, current PA coverage fails to meet even clearly defined national targets. A plan proposed by the Liberian government to protect 30% of Liberia's forest cover, for example, would still be insufficient to protect the country's chimpanzees (Junker *et al.* 2015b). Guinea offers the most striking example. Despite harbouring the largest chimpanzee population in the region, PA coverage is the lowest, at less than 1% (Brugière & Kormos 2009; Kühl *et al.* 2017).

There is a pressing need to increase PA coverage as a means of protecting chimpanzees (Kühl *et al.* 2017; Heinicke *et al.* 2019a). This first requires the definition of regional conservation goals, and for a strategic and comprehensive roadmap to be outlined to meet them.

Creation of new PAs should rely on a combination of systematic exercises, such as SCPs, which maximise biodiversity coverage and other ecological considerations (Brugière & Kormos 2009; Junker *et al.* 2015b), while balancing these characteristics with the political and economic considerations that will dictate political buy-in. The combination of these factors can significantly impact the effectiveness of PA creation on biodiversity longevity and should be carefully considered during the planning phase. Such actions are often intensive and require international financial support (Brugière & Kormos 2009).

Objective 7.1: By 2023, regional, spatial range-wide population and habitat conservation goals and priorities are identified for chimpanzees through robust scientific analysis using objective criteria, such as those defined for Key Biodiversity Areas or KBAs (IUCN 2016).

Table 4-20. Actions for establishing regional population and habitat goals

Actions	Methods	Indicators	Implementers
Establishment of regional population and habitat goals.	Convene stakeholders to establish range-wide population and habitat conservation goals for chimpanzees and agreement on priority areas for habitat conservation. Conduct scientific analysis to identify priority areas for habitat conservation.	Summary of stated regional population and habitat goals. Identification of priority areas for the establishment of new PAs and/or other habitat conservation measures. Identification of priority areas that could serve as sites for compensation funding from development and private sector projects to satisfy the goal of "net-gain".	Government agencies, A.P.E.S. database, researchers and possibly representatives from lending banks and private industries
Implementation of an awareness campaign to build international and local support for new PAs identified through SCPs at the national level.	Implement awareness campaign to build local, national and international support for habitat conservation measures.	Awareness campaigns designed and implemented.	Government agencies, NGOs, donors

Objective 7.2: By 2025, all existing PAs with chimpanzee populations have legally recognised boundaries for conservation purposes and no competing claims from other types of land use such as artisanal mining, industrial mining, timber or agriculture.

Table 4-21. Actions for ensuring that all existing PAs have legally recognised boundaries

Actions	Methods	Indicators	Implementers
Formalisation of land use in PAs and dis-incentivise other competing uses.	1. Obtain land titles for PAs where relevant. 2. Clearly delineate PA boundaries. 3. Raise awareness of PA boundaries by ministry and industry personnel. 4. Foster coordination across ministries to leave PAs intact.	Percentage of PA land coverage overlap.	Government agencies, protected area authorities (PAAs), NGOs
Mitigate bleed-over effects into PAs from adjacent industrial licenses.	Engage with industry stakeholders.	Mitigation strategies implemented where needed.	Government agencies, PAAs, NGOs, industries

Objective 7.3: By 2028, adequate habitat conservation protection coverage is achieved for western chimpanzees either through the gazettement of new PAs, other conservation measures, and/or funding mechanisms such as biodiversity offsets.

Table 4-22. Actions for ensuring that adequate habitat protection coverage is achieved for western chimpanzees

Actions	Methods	Indicators	Implementers
Planning of long-term support needs for each prospective conservation area, estimating start-up and annual financial costs.	Workshop for relevant national and local stakeholders.	Detailed 10-year roadmap of PA needs, goals, management and funding plans.	Government organisations, PAAs, NGOs
Creation of new PAs.	Once funding and support are secured, seek formal recognition of PA creation, following aforementioned roadmap.	Legal designation of PA passed into law.	Government agencies, PAAs, NGOs

Maintenance and optimisation of existing and new PAs

Although it has been argued that the presence of 'paper parks' can provide benefits to wildlife protection (Bruner *et al.* 2001), supporting evidence in West Africa suggests that PAs are only effective when these areas are adequately monitored and managed (Tranquilli *et al.* 2014). Others argue further that PAs where the exploitation of wildlife is poorly monitored and controlled may be worse for wildlife than if those areas were not formally designated (Boesch *et al.* 2017b).

It is crucial to ensure that PAs harbouring chimpanzees are adequately supported and optimally managed. Goals should be set for effective management with a balance of monitoring and direct action. Actions implemented should be those that have proven to be effective in similar habitat and circumstances in other locations in the region.

Multiple lines of evidence suggest that continuous research and/or guard presence has a positive effect on both chimpanzee and biodiversity maintenance in PAs (see, for example, Campbell *et al.* 2011; Tranquilli *et al.* 2014). Support should continue, therefore, for PAs with pre-existing research programmes. However, in PAs that do not already have these programmes, developing formal research programmes can be costly and may not be a feasible option, so other activities should be prioritised. A less costly, less intensive alternative to a permanent research presence is ranger patrols. In Taï National Park, Kablan *et al.* (2017) demonstrated that chimpanzee abundance levels responded positively to ranger patrol effort; however, chimpanzee abundance was only maintained when patrols were performed a minimum of 1.3 patrol days/km/year. This is one of the few conservation actions for primates for which there is sufficient evidence to show its effectiveness (N'Goran *et al.* 2012; Tranquilli *et al.* 2014).

Some interventions or activities, such as tourism, show promise under certain conditions, but have not yet been broadly validated as effective (Junker *et al.* 2017). Tourism is often logistically limiting, costly at start-up, and slow to show positive returns on investments (due to the slow process of habituating chimpanzees, for example; see Macfie & Williamson 2010). Interventions with strong support of effectiveness, such as anti-poaching patrols, should, therefore, be prioritised until the effectiveness of alternative conservation actions has been adequately investigated (see Strategy 2: Elimination of Research and Data Gaps).

While promoting the above actions, counteracting impediments to PA effectiveness should simultaneously be prioritised. Impediments to conservation effectiveness are weak governance, especially lack of law enforcement (see, for example, Greengrass 2016), and inadequate financial, technical and personnel support for ongoing activities (WWF 2018). As these impediments are not unique to PAs but are relevant region-wide, they are covered by strategies 4 and 9, for regional coordination mechanisms and conservation financing.

Additional impediments to PA effectiveness sometimes include an overemphasis on monitoring programmes at the expense of direct intervention. Information collected (by foreign researchers or local authorities) is also sometimes decentralised (Vimal 2017). Consequently, monitoring data collected are rarely disseminated to the management levels at which decisions transform them into action. PAs run the risk, as such, of being 'data rich but information poor'. Monitoring schemes are often treated as management end goals rather than as intermediaries towards informing effective conservation action (ibid.). To counter this, PA managers must ensure that they integrate monitoring data into pipelines that produce decision-making and real conservation (re)action (ibid.). This may come in the form of a number of actions that are outlined below.

Law enforcement team on a patrol mission, Taï National Park, Côte d'Ivoire © Tobias Deschner/WCF

Objective 7.4: By 2023, an effectiveness and capacity needs assessment for all PAs with significant numbers of chimpanzees has been conducted.

Table 4-23. Actions for assessing capacity needs for all PAs with significant numbers of western chimpanzees

Actions	Methods	Indicators	Implementers
Conduct a needs assessment to identify what new capacities and/or resources are needed for PAs with chimpanzees.	Periodically identify management needs and allocate appropriate resources.	Completed needs assessment for all PAs with chimpanzees.	Government agencies, NGOs, PAAs, donors
Completion of a baseline Management Effectiveness Assessment Tool (METT) analysis for PAs with chimpanzees.	Conduct METT assessments.	Completed METT assessment for all PAs with chimpanzees.	Government agencies, PAAs, NGOs, donors

Objective 7.5: By 2024, 100% of PAs with western chimpanzees have current or updated management plans that include chimpanzees as a conservation target, integrate local communities into decision-making processes, and improve integration of research programmes with management activities.

Objective 7.6: By 2026, 80% of PAs with chimpanzees have been evaluated for management effectiveness and have received a METT score of at least 60%.

Objective 7.7: By 2029, western chimpanzee populations are stable or growing in identified priority areas, including all PAs with significant chimpanzee numbers.

Table 4-24. Actions for updating PA management plans

Actions	Methods	Indicators	Implementers
Update PA management plans where needed and include chimpanzees as a conservation target.	Authorities require that all PAs with a western chimpanzee population treat them as a conservation target.	Updated management plans.	PAAs
Integration of local communities into PA decision-making processes.	Stakeholder meetings.	Measurable engagement of communities with park officials.	PAAs, NGOs
Improve integration of existing research programmes into PA management.	1. Require research programmes to provide systematic, layman-style reporting in national languages on research outcomes that are relevant to conservation action. 2. Encourage research programmes to plan research that informs conservation outcomes.	Number of reports per year. Number of active conservation-oriented projects (per programme).	PAAs, researchers working in PAs, NGOs
Optimise balance of monitoring and action programmes.	Ensure monitoring programmes have clearly articulated management goals.	Level of funding allocated to articulated action programmes.	PAAs, NGOs

Objective 7.8: By 2024, 80% of PAs with chimpanzees are implementing SMART or other appropriate patrol management and data recording systems.

Table 4-25. Actions for improving patrol management

Actions	Methods	Indicators	Implementers
Implement optimised patrol coverage for effective monitoring and law enforcement using SMART software or similar approach to patrol management.	Implement patrolling and management programme using SMART or other similar approach.	SMART and/or patrol reports produced on a semi-annual basis.	PAAs, NGOs, researchers
Provision of sufficient financial/technical/personnel support to patrols.	See Strategy 9: Conservation Financing		

Objective 7.9: By 2025, 80% of PAs with chimpanzees have adequate staffing and financial resources to conduct the minimum necessary chimpanzee conservation actions.

Table 4-26. Actions for ensuring that PAs have adequate staffing and financial resources

Actions	Methods	Indicators	Implementers	Budget
Provide sufficient resources to ensure adequate staffing and budgets for PAs harbouring chimpanzees.	See Strategy 9: Conservation Financing			

Strategy 8: Awareness raising

Despite widespread international interest in chimpanzees, awareness of the issues impacting their conservation is limited among some important stakeholder groups, including range country governments, local communities, industries, and border and customs agencies. This section proposes actions for increasing awareness of chimpanzees as a protected species, about the impacts of poaching and trafficking, human-chimpanzee interactions, and the importance of maintaining chimpanzee cultural and genetic diversity.

A key lesson from the implementation of the 2003 action plan was that relevant stakeholders were not adequately informed of its existence or the actions prescribed, especially in governments with high staff turnover (Kormos 2008). Other stakeholder groups remain unaware or unconcerned about the ongoing plight of western chimpanzees, their role in the subspecies' population decline, and opportunities to contribute to saving the species, despite the online availability of information regarding chimpanzee conservation. Even in cases where awareness was considered 'good', some key actors did not have the technical capacity to contribute to these actions appropriately. Therefore, an important factor identified during the 2017 workshop was to engage in active, multi-stakeholder-targeted awareness raising of issues related to western chimpanzee conservation in a culturally informed manner.

Promote awareness of the western chimpanzee action plan

In addition to concerns of inadequate policy and poor knowledge of best practices, there is a dire need to promote awareness of the current status of chimpanzees, the threats they are facing and the need for conservation action on their behalf. It is, therefore, imperative that relevant stakeholders are not only aware of this action plan, but also how the actions proposed herein relate to them – many require collaborative efforts and initiatives. Lessons learned from the dissemination of the 2003 action plan show the need to ensure comprehensive distribution of this revised plan.

Objective 8.1: By 2021 relevant decision-makers of all eight chimpanzee range state governments are aware of and possess a copy of this action plan.

Objective 8.2: By the end of 2021, all industrial projects in West Africa possess a copy and summary of this action plan.

Objective 8.3: By 2021, relevant NGOs are aware of this action plan and opportunities for overlapping objectives regarding chimpanzee conservation with other organisations.

Objective 8.4: By 2021, 100% of stakeholders in local, national and regional LUP possess a copy of this action plan and are aware of the need for incorporation of chimpanzee conservation in their plans.

Table 4-27. Actions needed to promote awareness of the western chimpanzee action plan

Actions	Methods	Indicators	Implementers
Creation and implementation of a communications strategy that targets stakeholders, including private sector companies, government agencies, lending banks, development organisations and NGOs.	Gather key action plan contributors to design and implement a communications strategy.	All stakeholders are aware of the action plan and have a copy or know how to access it online.	SGA, GRASP, FFI with IFC, FSC, RSPO, and others
Creation and dissemination of a summary of the action plan to communicate key points to select audiences.	Identify authors to write and design a summary brochure.	Summary created and disseminated.	SGA, GRASP, NGOs

Staff from the Forestry Department Authority of Liberia, FFI, LCRP and WCF inaugurate an awareness-raising mural in Liberia for the first annual World Chimpanzee Day © LCRP

Increase public awareness regarding poaching, capturing and trafficking of chimpanzees

Campaigns are needed to raise public awareness about the conservation impacts of killing chimpanzees for bushmeat and trafficking their orphans to achieve the associated behaviour change. Urban markets are significant drivers of commercial bushmeat trade (see Junker *et al.* 2015a; Ordaz-Németh *et al.* 2017), therefore, awareness campaigns should target stakeholders across the entire supply-and-demand chain. There are examples of positive outcomes of targeted campaigns to reduce hunting of chimpanzees (Guinea: Pailler *et al.* 2009) and consumption of chimpanzee meat (Côte

d'Ivoire: Kouassi *et al.* 2019). It is critical that the public and border officers and agencies be familiar with laws pertaining to chimpanzees, especially the illegality of chimpanzee trafficking, to address supply and transport networks of the trade.

Objective 8.5: By the end of 2021, all eight western chimpanzee range states have national awareness-raising strategies that explicitly target chimpanzee conservation.

Objective 8.6: By 2024, widespread regional public awareness campaigns addressing laws pertaining to chimpanzee poaching and trafficking have been rolled out, with a special focus on Guinea, Liberia and Sierra Leone, using social media, radio, television and newspapers.

Objective 8.7: By 2024, 100% of the populace of range states with the highest chimpanzee bushmeat consumption are aware of the illegality of killing and trafficking of chimpanzees for food and the pet trade and the health risks involved.

Objective 8.8: By 2022, all strategic locations such as ports and land borders display billboards, to deter people from poaching and trafficking chimpanzees and to pressure officials to adequately enforce the laws.

Table 4-28. Actions needed to increase public awareness regarding the illegality of poaching, capturing and trafficking of chimpanzees

Actions	Methods	Indicators	Implementers
Creation of a regional chimpanzee awareness campaign to reduce chimpanzee bushmeat trade, and alert people to the associated health risks.	Social media, radio, television, newspapers, strategically placed billboards, theatre performances.	A finalised plan to conduct an awareness campaign.	Governments, conservation NGOs, sanctuaries, chimpanzee experts, expert input from communication and behaviour change specialists and any other relevant partners, including research institutions
Implementation of appropriate awareness campaigns targeting identified audiences.	Social media, radio, television, newspapers, strategically placed billboards, theatre performances.	Pre- and post-data analysis revealing that significant, sustained changes have occurred in the behaviour of people across western chimpanzee range states regarding chimpanzee poaching and trafficking.	Governments, conservation NGOs, chimpanzee experts, sanctuaries and any other relevant partners, including expert input from communication and behaviour change specialists and research institutions

A camera trap image of a chimpanzee in Cantanhez National Park, Guinea-Bissau © Elena Bersacola

An awareness-raising performance for local communities by theatre group "Ymako Teatri" in collaboration with WCF, Côte d'Ivoire © WCF

Increase awareness to promote human-chimpanzee coexistence

With human population growth, ongoing conversion of natural habitat, and 83% of western chimpanzees living outside formally protected areas, effective strategies to promote human-chimpanzee coexistence are urgently required (see Human-Chimpanzee Interactions). Culturally informed and carefully executed awareness raising to targeted user groups, that takes account of the costs and risks of living near to chimpanzees (such as crop-foraging and aggressive encounters), as well as the influence of disagreements between different human-interest groups, might help to reduce conservation conflicts promoting coexistence, whilst deterring retaliatory killings of chimpanzees (Redpath *et al.* 2013).

Objective 8.9: By 2022, develop multiple platforms for awareness raising regarding chimpanzee behaviour, the importance of local taboos prohibiting the killing and consumption of chimpanzees, and the laws protecting chimpanzees.

Objective 8.10: By 2023, chimpanzee sanctuaries and other relevant NGOs and partners raise public awareness of human-primate interactions in the region in a culturally-appropriate way and using non-inflammatory language (see Human-Chimpanzee Interactions) when it comes to bolstering the understanding of why chimpanzees are motivated to forage on crops, why chimpanzees may behave agonistically towards people, and the laws protecting chimpanzees.

Table 4-29. Actions needed to increase awareness to promote human-chimpanzee coexistence

Actions	Methods	Indicators	Implementers
Improvement of public awareness in the region about issues related to people-chimpanzee coexistence and laws protecting chimpanzees.	1. Consultation among local communities, authorities and any relevant NGOs and chimpanzee sanctuaries involved in environmental education. 2. Radio, television, adapted pamphlets, newspapers, theatre performances, music or other suitable media.	Pre- and post-evaluation reveals >80% improvement in recipients' understanding of drivers of crop foraging, behaving appropriately when encountering a chimpanzee, and laws protecting chimpanzees.	Research institutions, media experts, chimpanzee sanctuaries, relevant NGOs and partners in West Africa

Increase awareness of the value of chimpanzee genetic and cultural diversity

Lastly, as outlined in Strategy 2 (Elimination of Research and Data Gaps), chimpanzees are one of a few species which demonstrate culture across populations (see, for example, Whiten *et al.* 1999), and this warrants specific and targeted attention as a conservation tool (see, for example, Brakes *et al.* 2019; Kühl *et al.* 2019). Once sufficient cultural and genetic baselines are established (see Strategy 2: Elimination of Research and Data Gaps), efforts should be made across stakeholders not only to preserve chimpanzee numbers, but also to preserve cultural baselines on the merit of genetic and cultural diversity value. Information campaigns about chimpanzee culture, its similarities to human culture, and the added conservation value of preserving cultural diversity should be a priority, as well as outlining the need for preservationist actions that have been proposed here and by others.

Objective 8.11: By the end of 2021, relevant stakeholders have publicly endorsed the value of genetic and cultural diversity of western chimpanzees.

Objective 8.12: By the end of 2023, the value of maintaining the cultural and genetic diversity of western chimpanzees is articulated in performance standards and policies of financing institutions and the private sector, and compliance to these standards is monitored.

Table 4-30. Actions needed to increase awareness of the value of chimpanzee genetic and cultural diversity

Actions	Methods	Indicators	Implementers
Development of a 'road map' to initiate awareness raising of the importance of chimpanzee cultural and genetic diversity with policymakers.	Meeting of western chimpanzee conservation stakeholders.	Road map developed and distributed.	NGOs, research institutions
Conduct awareness, outreach and advocacy campaigns and capacity development for policy makers regarding chimpanzee cultural and genetic diversity.	Design an awareness and outreach campaign.	Language of cultural and genetic diversity incorporated into plans/ policies of relevant stakeholders.	NGOs, researchers, environmental journalists, species working groups

Chimpanzee fishing for algae from a pond, a behaviour also known as algae-scooping. Bossou, Guinea © Tatyana Humle

Strategy 9: Conservation financing

Sustainable financial mechanisms

Two financial mechanisms in particular have been identified in recent years as potential solutions to the problem of inadequate conservation funding: conservation trust funds and biodiversity offsets, although the two are not mutually exclusive.

Conservation trusts

Conservation trusts provide sustainable financing through endowments that earn a rate of return thereby providing an annual or regular stream of funding. An example of a conservation trust is the Sangha-Trinational Foundation, which was capitalised by the German development agency, Kreditanstalt für Wiederaufbau (KfW) group, as well as through private companies. At present, low interest rate levels have reduced the attractiveness of conservation trusts. However, conservation trusts still provide one of the best options for ensuring a reliable source of sustainable funding for conservation projects.

Biodiversity offsets

As mentioned in Strategy 6: Land-use Planning, biodiversity offsets are used as a last resort to compensate for the adverse impacts of development projects on chimpanzees (and other wildlife) and their habitats. The use of offsets is only appropriate after having rigorously followed the mitigation hierarchy framework and after every other possible solution for avoiding impacts to the target species has been explored. The aim of offsets is to preferably achieve a new gain for a chimpanzee population or at least no net loss. In order to properly compensate for the loss of chimpanzees, offsets must take into account the cumulative impacts of development, prioritise offset sites to ensure new protection of the best available habitat, aggregate offsets for an entire region or country, and align with national biodiversity objectives (Kormos *et al.* 2014). Conservation trust funds will ideally be established as part of the offset process to ensure sustainable funding of management costs in perpetuity.

Objective 9.1: By 2025, at least one conservation trust is capitalised and providing a recurring stream of funding to one or more chimpanzee projects in West Africa.

Objective 9.2: By 2030, 50% of biodiversity and offset projects are designed and implemented as part of a National Offset Strategy with a corresponding governance structure that i) sets up a conservation trust fund to ensure management costs in perpetuity; ii) takes into account the cumulative impacts of development; iii) identifies priority offset sites; iv) promotes aggregated offsets; and v) aligns biodiversity offset and compensation projects with national biodiversity conservation objectives.

Table 4-31. Actions for sustainable financial mechanisms

Actions	Methods	Indicators	Implementers
Implementation of a 'road map' for setting up a national-level trust fund for biodiversity conservation which will ensure that funds are available to support chimpanzee conservation.	Develop a guidance document on how to set up a national-level trust fund.	Each country has a road map for setting up a national-level trust fund for biodiversity conservation that will ensure funding to implement chimpanzee conservation.	Relevant ministries, NGOs, World Bank and IFC

Recommendations and actions for donors (foundations, bilateral government and multilateral government assistance)

Chimpanzee conservation projects are financed largely through grants from external donors to local and international biodiversity NGOs. Maintaining an adequate in-country presence of NGO staff, equipment, infrastructure and vehicles is often only possible by securing multiple grants from a variety of funding sources, which often last less than 2 years. NGOs provide critical technical support to government agencies charged with wildlife protection and PA management. NGOs also provide an important link to funding from external sources that governments are unable to access directly. Researchers based at academic institutions both in and outside the region bring important expertise and resources to improve current understanding of the many facets of chimpanzee behaviour and biology needed to inform wildlife management practices. Large, long-term funding sources are needed to reduce the transactional costs of overly burdensome proposal and report writing. Provision of sustained, relatively large amounts of funding would reduce the operational costs of conservation organisations and enable them to focus on implementing conservation programmes rather than the logistics of financing them.

Objective 9.3: By 2023, more than 50% of chimpanzee conservation donors, and where possible donors to biodiversity conservation in general, will have developed a harmonised approach to reporting that allows grant recipients to produce a single annual report on an agreed set of conservation measures.

Objective 9.4: By 2023, existing chimpanzee and biodiversity conservation donors will have lengthened the terms of their grant cycles and increased the number of longer term, multi-year awards available.

Objective 9.5: By 2030, a greater amount of funding is available for western chimpanzee conservation than in 2020.

Table 4-32. Actions for recommendations and actions for donors

Actions	Methods	Indicators	Implementers
Convene a meeting of donors to identify means of streamlining financial assistance to the region, thereby reducing the transactional costs of implementing multiple awards.	In-person meeting followed by a report containing a unified strategy by donors in the region for more harmonised financial assistance.	Financial assistance guidelines of major donors harmonised to streamline project reporting.	Arcus Foundation, USFWS, Critical Ecosystem Partnership Fund, KfW, European Commission DEVCO, GEF, others
Set up a joint donor/NGO capital campaign to target potential new donors and lobby developed country governments to increase funding available for chimpanzee conservation.	Strategy developed in collaboration with existing great ape conservation donors and NGOs.	Increased level of funding for western chimpanzee conservation.	Donors and NGOs
A coordinator (part-time) is recruited and funding provided to ensure adequate follow-up coordination, fundraising, and monitoring of the implementation of this action plan.	Individual and host institution identified and funded, with agreed Terms of Reference.	Coordinator in place.	NGOs and donors

Government agency budgets (national environmental agencies and non-environmental agencies such as customs, justice, education)

Generally, wildlife and environmental agency budgets in tropical countries are insufficient for effective conservation action, and West Africa is no exception. The mere existence of 'paper parks', coupled with observable chimpanzee population declines in other PAs is evidence of the insufficient and ineffective support that many PAs in the region receive, including ones that straddle more than one country. There is a pressing need, therefore, to supply national and transboundary PAs and other management units with adequate resources to apply effective conservation actions.

Objective 9.6: By mid-2025, all national environmental agencies (NEAs) in range state countries have defined technical, logistical and financial needs of all chimpanzee conservation-related activities under their jurisdiction for the next five years.

Objective 9.7: By mid-2025, all PAs have published/made available a detailed report of their technical, logistical and financial needs for the next five years.

Table 4-33. Actions needed for government agency budgets

Actions	Methods	Indicators	Implementers
Each PA has published a detailed list of financial, logistical and technical support needed for their patrol plan/road map (see Table 4-22) and other programmed activities.	PA managers write report, with feedback from experts, when requested. The gap between current and preferred funding levels is stated, and how PAs would benefit from financing created as a result of conservation offsets.	Report made available to a central organisation for distribution to potential funders.	PA managers and partners
NEAs publish a detailed list of financial, logistical and technical support needed for environmental governance within their jurisdiction.	NEAs write report, with feedback from experts, when requested.	Report made available to a central organisation for distribution to potential funders.	Government-level natural resource management agencies
PA needs are revisited every five years, re-defined and republished.	PA managers write report, with feedback from experts when requested.	Report made available to a central organisation for distribution to potential funders.	PA managers and partners
Each NEA's needs are revisited every five years and re-defined.	NEAs write report, with feedback from experts when requested.	Report made available to a central organisation for distribution to potential funders.	Government-level natural resource management agencies

Artisanal gold mining in a chimpanzee stronghold, Senegal © Erin Wessling

Financial support to sanctuaries related to chimpanzee conservation

Chimpanzee sanctuaries in West Africa urgently require mechanisms for financial sustainability that minimise their dependency on donor funding to maintain and develop their activities. In this context, it is critical that financial support for the long-term care of confiscated individuals is factored into government agencies involved in law enforcement, and the budgets of NGO projects assisting government agencies. Since sanctuaries also play a key role in chimpanzee conservation, it is important that governments acknowledge this contribution and include sanctuaries when developing national or regional plans that will affect chimpanzee conservation. Finally, some sanctuaries require technical assistance with developing financial plans (and supporting systems and processes) to maximise their sustainability and enhance their ability to effect positive outcomes for chimpanzee conservation.

Objective 9.8: By 2023, the costs to chimpanzee sanctuaries of increasing numbers of wildlife seizures are factored into government, NGO and private sector projects that include a wildlife law enforcement objective.

Objective 9.9: By 2023, governments in the region recognise the important role sanctuaries play in enhancing conservation awareness, facilitating law enforcement, and developing national chimpanzee conservation programmes.

Table 4-34. Actions for financial support to sanctuaries related to chimpanzee conservation

Actions	Methods	Indicators	Partners
Donors and NGOs factor the impact of increasing law enforcement activity resulting in a higher level of seizures on the operational budgets of chimpanzee sanctuaries.	Donors and NGO wildlife law enforcement projects develop project budgets with support for sanctuaries.	Donor grant requirements reflect the need to provide funding to sanctuaries for law enforcement related projects.	NGOs, donors and sanctuaries
A brochure is designed to highlight the ways that chimpanzee sanctuaries contribute to conservation.	PASA or other NGO produce and distribute brochure to government and other appropriate audiences.	Increased awareness among government authorities of the importance of sanctuaries to conservation.	Governments, sanctuaries, PASA

CCC in Guinea conducts awareness programmes with local communities around Upper Niger National Park © CCC

Education and training (university programmes, training institutes, scholarships)

Ensuring sustainable conservation programmes in the region requires a high level of academic and educational capacity. University science programmes are essential to developing primatologists and wildlife professionals. Wildlife science capacity is vital to ensuring the proper functioning of the CITES scientific and management authorities. The region's university programmes in the wildlife sciences have not been properly funded and supported over the years. Improving support to academic wildlife science programmes in each of the chimpanzee range countries will increase the number of qualified scientists and conservationists to guide chimpanzee and wildlife conservation programmes into the future.

Objective 9.10: By 2023, a strategy to increase the capacity of university wildlife-related science programmes based on a needs assessment is in place.

Table 4-35. Actions for education and training

Actions	Methods	Indicators	Partners
Develop a strategy for improving the capacity of wildlife-related research programmes in universities.	Conduct a needs assessment and create a capacity development strategy.	Strategy in place and being used to develop funding proposals.	Academic institutions in the region and overseas

Participants in a primatology training programme organised by Guinée Écologie © Guinée Écologie

Management and technical capacity of government agencies

Providing technical support to national environment agencies (NEAs) and PAs means providing the logistical support (for example, equipment, computers) to scaffold technical needs, as well as developing capacities related to specialised technical expertise, where they are needed. As detailed in Strategy 6 (Land-Use Planning), there is concern that the chimpanzees' (ecological) requirements are not being taken into account during LUP. Leaders of LUP exercises may not be aware of the chimpanzees' needs, may be insufficiently trained to understand how to incorporate these needs into their plans, or may not have personnel available to them who are trained in such tasks. Additionally, officials tasked with evaluating industrial ESIAs may not have the technical expertise to understand the impacts to chimpanzees. Lastly, to effectively monitor chimpanzee populations, NEA and PA authorities must be skilled in monitoring techniques. Technical training should therefore be provided to eliminate these gaps in expertise.

Objective 9.11: By 2029, technical equipment needs of managerial staff of 75% of PAs and all NEAs are met, as previously defined.

Objective 9.12: By 2029, all industrial ESIAs and LUP ESIAs are evaluated by trained officials who are educated in appropriate chimpanzee population monitoring techniques and the ecological needs of chimpanzees.

Table 4-36. Actions needed for management and technical capacity of government agencies

Actions	Methods	Indicators	Implementers
Ensure that PA and NEA officials are skilled in monitoring and data summation methods specific to chimpanzees.	Training workshops or periodic programme consulting.	Number of trainees in best practices for chimpanzee monitoring and data summation.	Researchers, NGOs, NEA and PA managers
Assess capacity needs of government to execute national offset strategies and setup capacity development strategies.	Expert hired to assess capacity needs.	Strategy implemented to develop capacity for a national approach to conservation offsets in each country.	NGOs, private sector, IFC
Create communication networks between PA/ NEA management and chimpanzee monitoring.	Voluntary technical committees of researchers, NGOs and government agency personnel.	Exchange of monitoring data and use is documented.	Researchers, NGOs, NEA and PA managers
Rangers and environmental agents are periodically trained in laws, monitoring methods and law enforcement techniques.	Training workshops.	Number of trained personnel.	NGOs, researchers, governmental organisations
LUP and ESIA stakeholders (companies, environmental experts, governmental review boards) are trained in best practices for incorporating chimpanzee ecological and conservation needs into LUPs and ESIAs.	Training workshops.	Number of LUP and industrial ESIAs that evaluate impacts on chimpanzees.	ESIA stakeholders, NGOs, researchers, environmental experts

Camera trap being installed for biomonitoring, Cantanhez National Park, Guinea-Bissau © Kimberley Hockings

SECTION 5. ACTION PLAN IMPLEMENTATION

Implementation of the conservation strategy

Implementation and monitoring framework

Completion of the actions outlined in this plan will require commitment by all stakeholders to not only follow through on the actions described, but also to monitor and evaluate their implementation. Additional content that was produced from the workshop, including the conceptual models, will be made available through an online version of this action plan.

To ensure continued strong collaboration and communication among all stakeholders involved in the implementation of the plan we propose the following activities:

- Establishment of an implementation committee to ensure continued collaboration and communication to achieve the actions outlined in this plan;
- Creation of a western chimpanzee listserve to facilitate communication among stakeholders and provide regular updates;
- Organisation of national media events to launch the action plan in each western chimpanzee habitat country;
- Development and maintenance of a website to update and track implementation of this action plan and to update it as the actions and strategy evolve over time; and
- Support for an action plan coordinator to track completion of actions, ensure regular communications between the implementation committee and stakeholders, and maintain website content.

Two adult chimpanzees in a "handclasp" while grooming each other. Taï National Park, Côte d'Ivoire © Liran Samuni/TCP

Priority objectives

The top priority objective for each of the nine strategies and the top 10 priority objectives for the entire plan were identified via a survey of workshop participants. The survey was conducted online and secured 23 responses (i.e. from 38% of the workshop participants). In Table 5-1, Strategy 2 has tied objectives that were ranked equally.

Table 5-1. Top objective(s) for each of the nine strategies outlined in the current action plan

STRATEGY	OBJECTIVES
Strategy 1: Definition of Norms and Best Practices	**Objective 1.7:** By 2026, 100% of projects active in areas of ape habitat adhere to best practices for mitigating impacts of agricultural, logging and mining development.
Strategy 2: Elimination of Research and Data Gaps	**Objective 2.4:** By the end of 2022, 100% of conservation projects include an evaluation strategy for monitoring and evaluating the effectiveness of their actions.
	Objective 2.6: Beginning in 2021, a region-wide assessment of chimpanzee population status, threat levels and other identified indicators is measured and analysed at regular intervals.
Strategy 3: Policy Development and Legal Framework Review	**Objective 3.1:** By early 2021, a review of national legal frameworks related to western chimpanzees has been completed, including ESIA requirements and artisanal mining.
Strategy 4: Regional Coordination to Address Illegal Chimpanzee Trade	**Objective 4.4:** By 2023, develop and implement a capacity strengthening strategy to improve the effectiveness of officials in wildlife law enforcement, particularly in under-resourced areas such as land border crossings and seaports.
Strategy 5: Disease Monitoring and the One Health Model	**Objective 5.2:** By early 2022, risk analysis of the current status of western chimpanzee diseases completed, and by early 2023 a programme of disease risk mitigation implemented.
Strategy 6: Land-Use Planning	**Objective 6.7:** By 2028, all eight western chimpanzee range countries have performed national-level systematic conservation planning, including threat impacts and future scenario evaluation for chimpanzees, and the definition of conservation goals.
Strategy 7: Maintenance, Strengthening and Establishment of Protected Areas	**Objective 7.9:** By 2025, 80% of protected areas with western chimpanzees have adequate staffing and financial resources to conduct the minimum necessary chimpanzee conservation actions.
Strategy 8: Awareness Raising	**Objective 8.5:** By end of 2021, all eight western chimpanzee range states have national awareness-raising strategies that explicitly target chimpanzee conservation.
Strategy 9: Conservation Financing	**Objective 9.2:** By 2030, 50% of biodiversity and offset projects are designed and implemented as part of a National Offset Strategy with a corresponding governance structure that: (i) sets up a conservation trust fund to ensure management in perpetuity; (ii) takes into account the cumulative impacts of development; (iii) identifies priority offset sites; (iv) promotes aggregated offsets; and (v) aligns biodiversity offset and compensation projects with national biodiversity conservation objectives.

Each respondent was then asked to rank their top five priority objectives for the entire plan. The number of times an objective was ranked as either 1st, 2nd, 3rd, 4th or 5th was then multiplied by a score for the ranking (i.e. 5 for 1st, 4 for 2nd, etc.), generating a score for each objective. Table 5.2 presents the results of the top 12 priority objectives; several had equal scores.

Table 5-2. Overall priority objectives

RANK	OBJECTIVES	SCORE
1	**Objective 2.6:** Beginning in 2021, a region-wide assessment of chimpanzee population status, threat levels and other identified indicators is measured and analysed at regular intervals.	18
2	**Objective 1.9:** By 2024, 100% of industrial development projects adopt the mitigation hierarchy and implement the management plans presented in their ESIAs.	17
3	**Objective 1.2:** By 2024, West African countries with chimpanzee populations have harmonised policies on artisanal mining.	16
4	**Objective 1.4:** By 2022, best practices for mitigating negative human-chimpanzee interactions are updated and applied.	15
4	**Objective 1.6:** By 2022, best practices for mitigating the impacts of agricultural, logging and mining development have been defined and published, or updated.	15
4	**Objective 4.4:** By 2023, a capacity strengthening strategy to improve the effectiveness of officials in wildlife law enforcement, particularly in under-resourced areas such as land border crossings and seaports, is developed and implemented.	15
4	**Objective 6.11:** By 2024, 80% of industrial projects in West Africa adequately implement ESIAs with ARRC Task Force approval.	15
5	**Objective 3.3:** By early 2023, formal proposals for legal reforms exist and are promoted by relevant government stakeholders.	14
6	**Objective 4.3:** By 2022, a multi-year, cross-border action plan aimed at ending illegal capture and trafficking of chimpanzees is collaboratively developed and implemented.	12
7	**Objective 2.8:** By 2024, a cross-disciplinary approach is created to guide all relevant chimpanzee conservation strategies on how to be socially appropriate and maximise public participation.	11
7	**Objective 7.5:** By 2024, 100% of PAs with western chimpanzees have current or updated management plans that include chimpanzees as a conservation target, integrate local communities into decision-making processes, and improve integration of research programmes with management activities.	11
7	**Objective 9.1:** By 2025, at least one conservation trust is capitalised and providing a recurring stream of of funding to one or more chimpanzee projects in West Africa.	11

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APPENDIX I: LIST OF WORKSHOP PARTICIPANTS

Location or geographic focus	Name	Organisation
Global	Oscar Maldonado	Workshop facilitator
Global	Tomás Saratscheff	Assistant workshop facilitator
Côte d'Ivoire	Issa Diarrasouba	Office Ivoirien des Parcs et Réserves
Côte d'Ivoire	Abdoulaye Diarrassouba	Office Ivoirien des Parcs et Réserves
Côte d'Ivoire	Aboa Dogui	Société de Développement des Forêts de Côte d'Ivoire
Côte d'Ivoire	Zoro Bertin Gone Bi	Université Félix Houphouët-Boigny, CSRS & TCP
Ghana	Nana Kofi Adu-Nsiah	Forestry Commission, Wildlife Division
Ghana	Paul Tehoda	Kwame Nkrumah University of Science and Technology
Guinea	Mamadou Saliou Diallo	Guinée Ecologie
Guinea	Tatyana Humle	Durrell Institute of Conservation and Ecology, University of Kent
Guinea	Namory Keita	Ministère de l'Environnement, des Eaux et Forêts
Guinea	Saiba Mamady Keita	Ministère de l'Environnement, des Eaux et Forêts
Guinea	Alexandre Konate	University of Faranah
Guinea	Matthieu Laurans	Centre de Conservation pour les Chimpanzee
Guinea	Aly Gaspard Soumah	Institut Recherche Environnemental de Bossou
Guinea-Bissau	Elena Bersacola	University of Exeter
Guinea-Bissau	Fai Djedjo	Direction Générale des Forêts et Faune
Guinea-Bissau	Annemarie Goedmakers	Chimbo Foundation
Guinea-Bissau	Aissa Regalla	Instituto da Biodiversidade e das Areas Protegidas, Ministro da Agricultura e Desenvolvimento Rural
Liberia	Jim Desmond	Liberia Chimpanzee Rescue and Protection
Liberia	Jenny Desmond	Liberia Chimpanzee Rescue and Protection
Liberia	Benedictus Freeman	University of Kansas
Liberia	Joel Gamys	World Resources Institute
Liberia	Jerry Garteh	Society for the Conservation of Nature of Liberia
Liberia	Blamah Goll	Forestry Development Authority
Liberia	Weedor Gray	Forestry Development Authority
Liberia	Annika Hillers	Wild Chimpanzee Foundation
Liberia	Michelle Klailova	Fauna & Flora International
Liberia	Lisa Korte	USAID/Liberia
Liberia	Menladi Lormi	Forestry Development Authority
Liberia	Mary Molokwu	Fauna & Flora International
Liberia	Peter Mulbah	Conservation International
Liberia	Borwen Sayon	Forestry Development Authority
Liberia	Silvana Sita	Wild Chimpanzee Foundation
Liberia	Darlington Tuagben	Forestry Development Authority
Liberia	Tina Vogt	Fauna & Flora International
Senegal	Kane Lamine	Direction des Parcs Nationaux
Senegal	Papa Ibnou Ndiaye	Université Cheikh Anta Diop de Dakar

Location or geographic focus	Name	Organisation
Senegal	Liliana Pacheco	Jane Goodall Institute-Spain
Senegal	Doudou Sow	Direction des Eaux et Forêts, Chasses et de la Conservation des sols
Sierra Leone	Bala Amarasekaran	Tacugama Chimpanzee Sanctuary, National Protected Area Authority
Sierra Leone	Ibrahim Bakarr	Njala University
Sierra Leone	Benjamin Barca	Royal Society for the Protection of Birds
Sierra Leone	Mamady Dioumessy	Mano River Union
Sierra Leone	Bashiru Koroma	Sierra Leone National Tourist Board
Sierra Leone	Sulay Mohammed	National Protected Area Authority
Sierra Leone	David Momoh	Tacugama Chimpanzee Sanctuary
Sierra Leone	Ansumana Babar Turay	Ministry of Agriculture, Forestry and Food Security
West Africa	Michael Balinga	West Africa Biodiversity and Climate Change
West Africa	Frands Carlsen	Copenhagen Zoo
West Africa	Barry Greville-Eyres	West Africa Biodiversity and Climate Change
West Africa	Stefanie Heinicke	Max Planck Institute for Evolutionary Anthropology
West Africa	Nouhou Ndam	West Africa Biodiversity and Climate Change
West Africa	Elenora Neugebauer	Max Planck Institute for Evolutionary Anthropology
West Africa	Erin Wessling	Harvard University
Africa	Ken Cameron	US Fish & Wildlife Service
Africa	Marc Fourrier	Jane Goodall Institute
Africa	Elizabeth Macfie	IUCN SSC Primate Specialist Group
Africa	Helga Rainer	Arcus Foundation
Africa	Johannes Refisch	UN-GRASP

APPENDIX II: THREAT PRIORITIZATION METHODOLOGY

Scope: Most commonly defined spatially as the proportion of the target that can reasonably be expected to be affected by a threat within 10 years given the continuation of current circumstances and trends. For ecosystems and ecological communities, measured as the proportion of the target's occurrence. For species, measured as the proportion of the target's population.

Threat Level

- Very High: The threat is likely to be pervasive in its scope, affecting the target across all or most (71–100%) of its occurrence/population.
- High: The threat is likely to be widespread in its scope, affecting the target across much (31–70%) of its occurrence/population.
- Medium: The threat is likely to be restricted in its scope, affecting the target across some (11–30%) of its occurrence/population.
- Low: The threat is likely to be very narrow in its scope, affecting the target across a small proportion (1–10%) of its occurrence/population.

Severity: Within the scope, the level of damage to the target from a threat that can reasonably be expected given the continuation of current circumstances and trends. For ecosystems and ecological communities, typically measured as the degree of destruction or degradation of the target within the scope. For species, usually measured as the degree of reduction of the target population within the scope.

- Very High: Within the scope, the threat is likely to destroy or eliminate the target, or reduce its population by 71–100% within 10 years or three generations.

- High: Within the scope, the threat is likely to seriously degrade/reduce the target or reduce its population by 31–70% within 10 years or three generations.
- Medium: Within the scope, the threat is likely to moderately degrade/reduce the target or reduce its population by 11–30% within 10 years or three generations.
- Low: Within the scope, the threat is likely to only slightly degrade/reduce the target or reduce its population by 1–10% within 10 years or three generations.

Irreversibility (Permanence): The degree to which the effects of a threat can be reversed and the target affected by the threat restored.

- Very High: The effects of the threat cannot be reversed and it is very unlikely the target can be restored, and/or it would take more than 100 years to achieve this (for example, wetlands converted to a shopping centre).
- High: The effects of the threat can technically be reversed and the target restored, but it is not practically affordable and/or it would take 21–100 years to achieve this (for example, wetland converted to agriculture).
- Medium: The effects of the threat can be reversed and the target restored with a reasonable commitment of resources and/or within 6–20 years (for example, ditching and draining of wetland).
- Low: The effects of the threat are easily reversible and the target can be easily restored at a relatively low cost and/or within 0–5 years (for example, off-road vehicles trespassing in wetland).

Explanation of key terms

The *target* refers to the focal conservation target at the scale being assessed – in technical terms, the target occurrence within the defined project area (for example, small site, landscape, or even global scale). *Affected* means subject to one or more stresses from the threat. The *10-year* time frame can be extended for some longer-term threats like global warming that need to be addressed today. *Current circumstances and trends* include both existing as well as potential new threats. *Occurrence* for ecosystems is typically by area. Species includes both single species targets as well as multiple species guilds. If a species is evenly distributed, then the proportion of the target's population is the same as the proportion of the area occupied, but if it is patchily distributed, then it is not. In these cases, it is important to specify the unit of assessment for the target (for example, breeding pairs vs. nests vs. individuals).

For both ecosystems and species, the proportion is estimated as the percentage of the target's occurrence at the scale being assessed (for example, a water pollution threat affecting an aquatic ecosystem target is measured as the percentage of that aquatic ecosystem target affected, not the percentage of the area of the entire site).

Within the scope refers to both the spatial and temporal scope defined above. It is important to note that the severity rating is not made for the entire assessment area, but only within the scope the threat affects. Thus, if the scope of a hunting threat only affects a sub-population of the overall species target, the severity assessment is only made in relation to that sub-population. For ecosystem targets, *destruction or degradation* is defined in reference to one or more key attributes of the target. Likewise, damage to species targets is most often defined in terms of the *degree of reduction* of the key attribute "population size." In some cases, it may be appropriate to consider other key attributes for species targets, such as reduction of breeding pairs or reduction of juveniles.

Permanence applies to the *effects of the threat* on the target, not the threat itself. In other words, it is not a measure of how difficult it is to stop the threat, but rather to undo the stress caused by the threat on the target. It is important to note that the use of the permanence rating as specified is largely in respect to prioritising potential threats. If a threat is looming that will cause irreversible damage, then it makes sense to try to address that threat. However, if the threat has already occurred and the irreversible damage has already taken place, then it may not make sense to prioritise that threat for action.

Attribution: Oscar Maldonado

INTERNATIONAL UNION
FOR CONSERVATION OF NATURE

WORLD HEADQUARTERS
Rue Mauverney 28
1196 Gland, Switzerland
mail@iucn.org
Tel +41 22 999 0000
Fax +41 22 999 0002
www.iucn.org