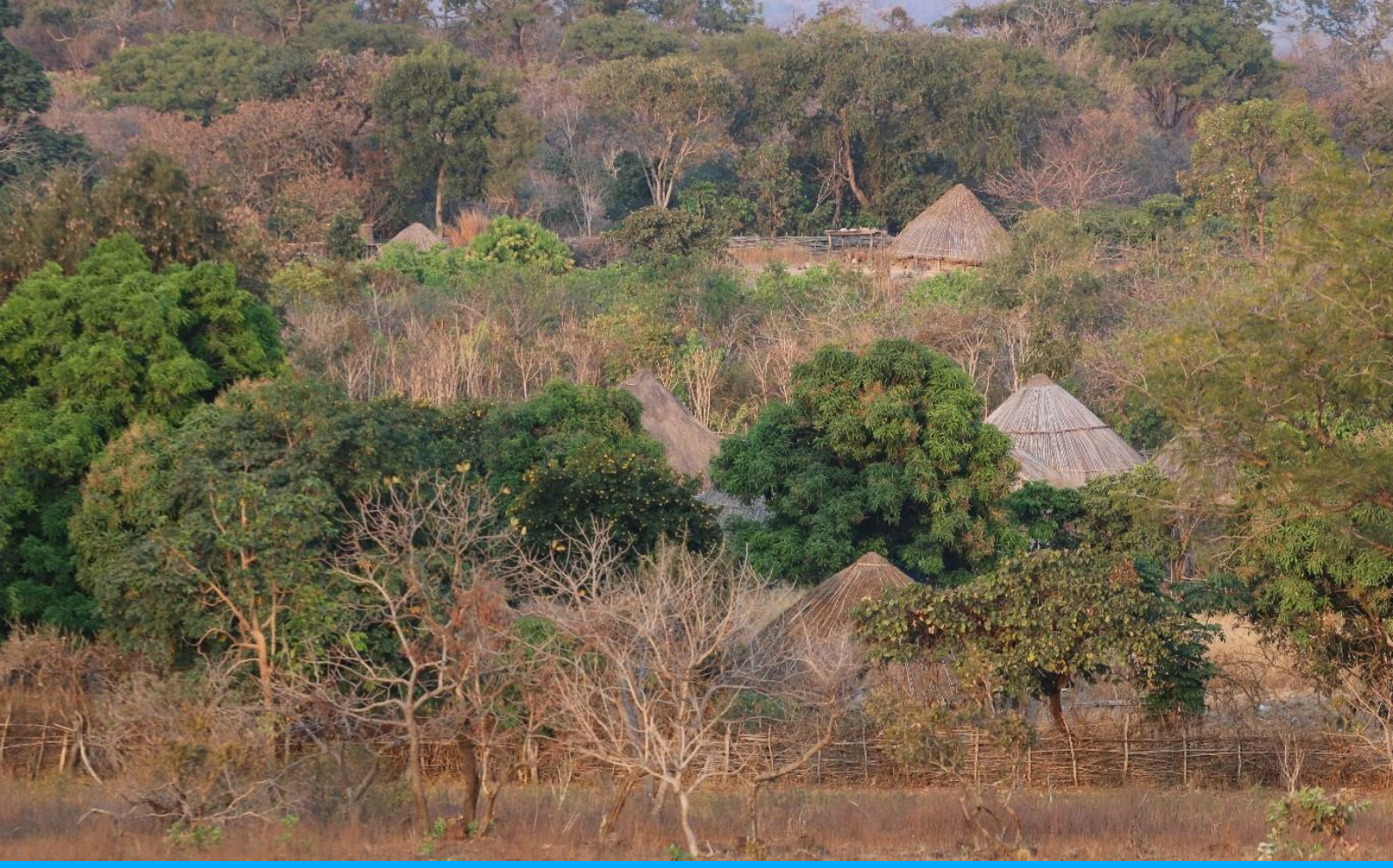

Moyen Bafing Chimpanzee Offset Feasibility Assessment

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TBC (2017) Moyen Bafing chimpanzee offset feasibility assessment. The Biodiversity Consultancy Ltd, Cambridge, UK and Conakry, Republic of Guinea.

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Executive Summary

This report assesses the feasibility of implementing a biodiversity offset in the Moyen Bafing landscape in Republic of Guinea in order to compensate for impacts that Compagnie des Bauxites de Guinée (CBG) and Guinea Alumina Corporation (GAC) will have on the Critically Endangered Western Chimpanzee (*Pan troglodytes verus*). Moyen Bafing is part of the Fouta Djallon, considered the most important landscape in Guinea (and one of the highest priority areas globally) for conservation of the Western Chimpanzee (Kormos & Boesch 2003). The Office Guinéen des Parcs et Réserves (OGUIPAR) and Wild Chimpanzee Foundation (WCF) are working together towards the creation of a c.7,000 km^2 Moyen Bafing protected area (MBPA) for conservation of c. 4,400 chimpanzees and other wildlife in this landscape.

This report assesses the suitability of the site as an offset in general; two short separate reports assess whether the site meets the specific offset requirements of each of the two companies. It is based on a review of available data (notably those provided by WCF), a field visit, remote sensing analysis, literature review and consultation with key stakeholders.

Background to Moyen Bafing and the MBPA

- The Wild Chimpanzee Foundation (WCF) conducted a nationwide chimpanzee survey in 2011-2012 to support GAC in locating a suitable offset site. A more detailed survey was conducted in 2013-2014, confirming the large number of chimpanzees in Moyen Bafing. Shortly after, WCF and OGUIPAR presented a project to support the conservation of chimpanzees in this area through the creation of a protected area that could protect over 4,000 chimpanzees as well as other wildlife, encompassing seven existing Classified Forests.
- An official mandate has been given to OGUIPAR and WCF by the Minister of Environment, Water and Forests to proceed towards protected area creation; this was issued in November 2015 and renewed in April 2016.
- OGUIPAR and WCF are taking a stepwise approach to protected area delimitation, in accordance with Guinean government procedures, and final protected area status and zoning will be determined through a consultative process involving local communities. An *Arrêté temporaire de classement*[1] is expected to be signed shortly, which will launch the next steps of studies, consultations and Social and Environmental Impact Assessment required prior to definitive protected area creation.
- For the purposes of this report, we have assumed that protected area creation will result in gazettement of an area of c. 7,000 km^2 under a variety of zoning arrangements, of which c. 3,500 km^2 will be a core area whose management will focus mainly on conservation.

[1] Ministerial-level acts such as the *Arrêté temporaire de classement* are not published in the Journal Officiel to become law. Only Presidential Decrees, acts of the National Assembly and the Supreme Court are.

- Although the site has been proposed as a protected area, it has no existing or planned government funding, and considering the economic situation in Guinea and the levels of finance provided to existing Protected Areas it seems unlikely that the MBPA would receive adequate support to ensure effective conservation management in the foreseeable future.
- Consequently there is a clear opportunity to implement a biodiversity offset that would generate gains that are 'additional' to what would otherwise have occurred.

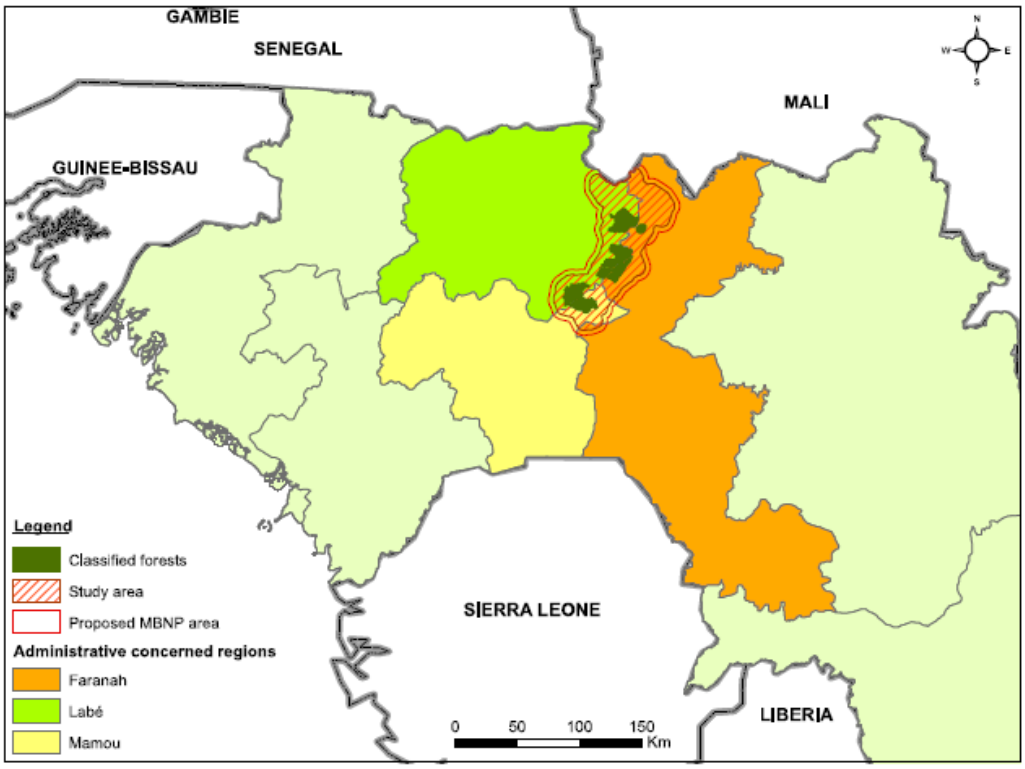

Figure 1: Location of the WCF study area for the proposed Moyen Bafing Protected Area in central Guinea (WCF 2016a)

Study questions and methods

- We assessed the feasibility of implementing a successful chimpanzee conservation project in the Moyen Bafing landscape against key feasibility criteria (ecological, socio-economic, institutional and legal, financial, and political).
- Following the conservation feasibility assessment, we evaluated the suitability of Moyen Bafing as an offset with reference to good international industry practice for offsets, over and above the feasibility of delivering conservation gains discussed above. Good practice principles that we used to guide our assessment included inter alia ecological equivalence,

additionality, use of a precautionary approach, long term outcomes, stakeholder involvement, and transparency[2].

Summary of key findings

Ecological feasibility

- Moyen Bafing supports a very large population of c. 4,400 Western Chimpanzees, potentially the largest in the world and sufficient for an aggregated offset to meet the needs of both CBG and GAC.
- There is an ongoing deforestation and degradation that over the long term poses a threat to the chimpanzee population.
- Hunting of chimpanzees is currently a relatively low threat, but could increase rapidly and significantly if access to the area improves.
- The planned Koukoutamba dam will have significant impacts on chimpanzees. However, assuming a reasonable degree of management of indirect impacts, it would not necessarily compromise the integrity or overall conservation significance of the landscape for chimpanzees, nor the suitability of the landscape as an offset.
- Other potential or planned developments (roads, hydropower, mining exploration) are unlikely to have significant impacts in the short- to medium-term.

Technical and socio-economic feasibility

- The Moyen Bafing landscape is home to a relatively large human population (c. 67,000 in c.400 villages) who depend on access to land and natural resources for livelihoods, cultural values and wellbeing.
- Moyen Bafing is a human-dominated landscape, although there are areas of lower population density. Villages make strong traditional claims to land, in some cases including within the existing classified forests.
- Socio-economic features of Moyen Bafing that may work in favour of conservation include: explicit local acceptance of chimpanzee presence, strong and functional traditional authority structures, generally clear traditional land tenure and local control over decision-making about land- and resource-use, limited commercial exploitation of natural resources and relative remoteness from markets.
- Socio-economic features that may make conservation more challenging include: the large number of people spread across numerous small villages, potential scarcity of fertile agricultural land (especially 'bas-fonds'), sometimes hostile attitudes to existing classified

[2] These principles are based on those developed by the multi-stakeholder Business and Biodiversity Offsets Programme (BBOP 2012a), informed by other industry guidance (ICMM & IUCN 2013; CSBI & TBC 2015) and incorporate the general requirements for use of offsets as part of the mitigation hierarchy under PS6.

forests, high local development aspirations in at least some cases, and no existing traditional institutions explicitly for natural resource management. Whilst addressing these issues will be challenging, there is no a priori reason to think that it will be impossible to address them and achieve effective conservation of chimpanzees given sufficient commitment, time, resources and an adaptive approach based on a recognition of local land and natural resource rights and focused on long-term outcomes.

- Key principles for the conservation project (such as no involuntary resettlement) and how they will be achieved should be made explicit in an updated *Fiche de Projet* to provide greater assurance that an appropriate approach will be followed.
- The MBPA project as currently planned does not foresee physical displacement or resettlement of local people, although potential for economic displacement is a significant challenge and risk to the project.

Institutional and legal feasibility

- Guinean legislation is ambiguous about treatment of customary land tenure in general, and about land-tenure in protected areas in particular.
- National park status in Guinea is flexible and has the advantage of clarity about industrial use within the park. However, there is ambiguity in the legal texts dealing with zoning and allowed activities within a national park.
- Integrating clear principles and an implementation strategy for land-tenure and allowed uses into an updated *Fiche de Projet* would provide assurance that the protected area creation process will seek to align with best practice, including PS5.
- If national park status is retained as the preferred option, the planned *Arrêté temporaire de classement* provides an opportunity to avoid potential ambiguities. Explictly recognising land-tenure and use-rights in the arrêté will avoid the risk of creating unnecessary conflicts with local communities and reputational risks for companies investing in an offset and provide assurance that the potential to align with PS5 requirements will not be prejudiced.
- The revised *Fiche de Projet* and *Arrêté temporaire de classement* should be reviewed by individuals familiar with the Guinean legal system, with protected area management and with PS5 prior to validation.

Financial feasibility

- The in-the-field costs of establishing and managing a c.7,000km^2 protected area with multiple zones over 20 years are estimated at between USD35m and USD64m, based on current unit costs in Guinea, an illustrative set of conservation actions and assuming a hybrid model of implementation by an NGO-Government of Guinea (GoG) partnership supported by specialist expertise as required. These cost estimates do not include the establishment and running costs of a trust company or similar vehicle for managing funds.
- These cost estimates are not out of proportion to the scale of the investment being made and planned by CBG and GAC respectively. Neither are they out of line with the costs of offsets for residual impacts of similar significance elsewhere.
- These cost estimates cover protected area set-up and 20 years of implementation, which is the forecast duration for delivering a net gain.

- If only a single company were to invest (and other sources of funds were not available), it may be prudent to consider developing the MBPA in a phased approach so that the majority of resources are concentrated in a portion of the landscape until full funding becomes available, either from other mining companies or development projects seeking a biodiversity offset, or from conservation donors.
- Overall, it is considered financially feasible to implement an offset in the MBPA.

Alignment with good practice principles for biodiversity offsets

- The proposed offset site is in line with international good practice principles for biodiversity offsets including *inter alia* additionality of gains, potential to lead to an increasing chimpanzee population and suitability as an aggregated offset.

Implications of the Koukoutamba Dam for offset feasibility

- The Koukoutamba dam project comprises an 86 m high dam and associated infrastructure that would be constructed within the boundaries of the proposed MBPA. It is considered a national development priority at the highest levels in Guinea and so is likely to go ahead, though funding and timing are not yet clear.
- Our analysis corroborates WCF's estimate that the Koukoutamba Dam Project is likely to result in very substantial losses of chimpanzees, equivalent to the loss of an entire 'Exceptionally Important Chimpanzee Population' or more.
- Notwithstanding this very serious negative impact, the feasibility study indicates that, provided there is reasonably effective management of the indirect impacts of the dam project, there would still be a sufficiently large chimpanzee population in the wider Moyen Bafing landscape to allow for implementation of an aggregated offset that would meet the needs of both GAC and CBGs.
- This assumes 1) that effective management of the proposed protected area is established rapidly and prior to dam construction, 2) that the Government of Guinea, *Organisation pour la Mise en Valeur du fleuve Sénégal* (OMVS) and the contractor chosen to build the dam collaborate effectively with the proposed protected area and implement good practice avoidance and minimisation of both direct and indirect impacts.
- Using the same assumptions about potential gains as applied for GAC and CBG, it is not feasible for the proposed protected area to serve as an offset delivering a net gain for chimpanzees for GAC, CBG and Koukoutamba simultaneously, even in an optimistic scenario for Koukoutamba's impacts. A significant financial contribution from Koukoutamba to the MBPA could help to ensure effective long-term management, thereby securing the longevity of gains from an offset by GAC and CBG. However, such a contribution is very unlikely to be able to meet the standards of no-net-loss or net gain for Koukoutamba's own impacts (even if impacts on this scale are considered offsetable).
- Further assurance from the Government of Guinea and OMVS would be prudent prior to investment in the offset. This could take the form of explicit language in the *Arrêté temporaire de classement* that will launch the formal park creation process, and publication of the Government's strategy for Koukoutamba. WCF is actively working towards these and publication of both is expected to be imminent.

Conclusions

Overall the report concludes that:

- Moyen Bafing is one of the most important areas in the world for Western Chimpanzee, with a sufficiently large chimpanzee population for an aggregated offset that would meet the needs of both CBG and GAC.
- Moyen Bafing is an appropriate offset site from the perspective of its ecological equivalence and the technical, socio-economic, institutional, financial and political feasibility of achieving ecological gains.
- Factors that improve the feasibility of delivering tangible conservation gains for chimpanzees include: a large and viable population of chimpanzees throughout the landscape, large areas of suitable chimpanzee habitat, the current coexistence of people and chimpanzees that is based on active acceptance of chimpanzee presence by local people, the existence of functional and legitimate authority structures within villages that provide a potential entry point for improved resource management, the relative remoteness of the area, the current lack of commercial-scale trade in natural resources, demonstrated political will and the presence of a highly motivated technical conservation partner.
- Particular challenges include: the large area and difficult accessibility, determination of appropriate legal conservation status to balance conservation objectives with the rights and aspirations of local communities, defining appropriate institutional structures for managing conservation in configurations that transcend existing administrative units, equity considerations (especially the challenges with integrating women and other marginalised groups into decision making), and finding effective ways to address issues of sustainability of the use of land and natural resources.
- Although conservation intervention is always challenging, there do not appear to be any critical issues which would impede the creation of an offset at this site.
- The Koukoutamba Dam is not considered to present an insurmountable obstacle to the successful implementation of an aggregated biodiversity offset sufficient to meet the needs of both GAC and CBG. However, it does present significant challenges and risks, and obtaining further assurance from the Government of Guinea and OMVS would be prudent prior to investment in an offset.

These findings and potential solutions are outlined in the summary assessment in Table 1 below. Addressing these challenges will require significant resources as well as commitment and good technical leadership. However, potential approaches for dealing with the challenges exist (see Table 1) and have been proven in other circumstances. These approaches have been discussed with WCF and OGUIPAR and are seen as compatible with the conservation objectives of the project.

Table 1: Summary feasibility assessment

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
Ecological equivalence	Ecological equivalence is sufficient for site to be considered suitable as a biodiversity offset. Same subspecies of chimpanzee as at impact site Broadly similar mix of habitat types, but floristic composition and similarity not known. No other CBG or GAC CH species confirmed present though the presence of the Western Black-and-white Colobus is reported.	No significant challenges requiring addressing at this stage.		Suitable	Minor	Minor
Ecological feasibility of gains	Chimpanzees are abundant and widespread. Threats are currently low, but could increase rapidly as access to the area improves.	No significant challenges requiring addressing at this stage.		Feasible	Minor	Minor
Chimpanzee-specific considerations	The offset model proposed envisages stabilising/increasing the chimpanzee population rather than just slowing declines; this will be verified through monitoring and	No significant challenges requiring addressing at this stage		Suitable (but stable/increasing chimpanzee population must be	Minor	Minor

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
	evaluation (M&E), so it is in line with the chimpanzee-specific offset principles outlined in Section 3.2. The use of additional 'insurance sites' was considered but not deemed necessary because the proposed offset is at a sufficiently large spatial scale that partial failure is unlikely to compromise the entire site			demonstrated by ongoing M&E)		
Technical feasibility of gains	Threats to chimpanzees are currently relatively low, and principally driven by subsistence rather than commercial activities. There is therefore a window of opportunity to establish sustainable practices compatible with long-term conservation prior to significant opening up of the area. Although threats are currently relatively low, they are likely to increase and be significant over the next 20 years; by reducing these current and future threats the offset can result in gains that would not otherwise have occurred, i.e. gains that are 'additional'.	Given many local communities do not hunt chimpanzees, enlisting their support for protection of chimpanzees could facilitate control of hunting by outsiders. Conversely, alienating local communities could make enforcement extremely hard. Newcomers may not share local communities' respect for chimpanzees, so in-migration could pose a challenge to effective management of this threat.	Work with local communities to ensure they are allies for chimpanzee conservation and ensure they perceive benefits of conservation prior to implementing measures that would restrict access to resources or according to the former land tenure (e.g classified forest.) Implement good practice management and monitoring of enforcement, with a focus on ensuring human rights are respected.	Feasible	Moderate	Moderate

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
		Implementing conservation by providing development benefits has proved challenging in previous projects, particularly due to tenuous links and weak conditionality between benefits and conservation actions. This will be particularly challenging in Moyen Bafing given the large number of villages involved.	Ensure development actions that are designed to lead to improved conservation behaviour are appropriately significant, sustainable, targeted, conditional and monitored. In particular for the villages close (land inside the core area) or located in the core area of the protected area. Involve a partner experienced in the design of such interventions early in conservation planning.	Hard but feasible	Major	Moderate
		Key threats to chimpanzees over the long term are habitat loss due to agricultural expansion, fuelwood / charcoal extraction and (potentially) cattle grazing. Fire and hunting are also potential threats that require further investigation (and, if warranted, active management). All of these threats are liable to be exacerbated by population growth (there is no information on population	Ensure lessons are learnt from previous development projects in the Fouta Djallon and in sub-Saharan countries (including various successful reforestation projects in Senegal, Mali and Niger) and enlist a competent technical partner to help identify and trial the most appropriate approaches. Apply good conservation planning practice to implement adaptive management, based on carefully described 'theories of change' and	Challenging	Major	Major

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
		trend but an increase is a reasonable and precautionary assumption), and by improved access to markets caused by road construction. Despite intensive efforts by development projects over many decades in the Fouta Djallon, there are few proven "shovel-ready" interventions. Whilst there is time to address this threat, the level of difficulty should not be under-estimated.	actively testing assumptions through monitoring and evaluation.			
Socio-economic feasibility of gains	The landscape has a significant human population, with c. 300 villages / 50,000 people in the focal conservation area and c.400 villages / 67,000 people in the wider landscape; the rate of population increase (or decline) is unknown but an annual increase is a reasonable and precautionary assumption. However, the area being considered as a core	Although communities explicitly accept the presence of chimpanzees, they also have significant development aspirations that if not taken into account could create hostility to conservation.	Clearly recognise that development aspirations are legitimate and that in some cases trade-offs with chimpanzee conservation will be necessary. This approach should be made explicit in the fiche de projet, and management budgets need to be allocated accordingly.	Feasible	Moderate	Minor

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
	protected area has far fewer villages and no physical resettlement is envisaged. Although the MBPA project does not plan to cause any involuntary, some level of economic displacement is likely to occur. Its scale is unknown and depends on various factors (e.g. rate of population growth/influx, the zoning model that is implemented, and the nature of any restrictions on land access or subsistence activities, etc). The potential for economic displacement is a significant issue and risk to the success of the offset. There is explicit acceptance of chimpanzees by the majority of local people, which provides an excellent basis for conservation. However, there is a very high level of human poverty and dependence on natural resources, and threats to chimpanzees are tightly linked to local subsistence activities which could increase conflict in the future. As part of the process of PA creation it would be necessary under Guinean law to undertake an SEIA to assess *inter alia* social impacts of Protected Area creation and determine appropriate mitigation. This should refer to relevant Performance Standards (including PS5 and others). The SEIA should explicitly consider	Portions of a large number of village territories fall within or close to the proposed protected area and inhabitants will need to be engaged and negotiated with to address issues of access to resources and potential impacts on livelihoods.	The MBPA project approach focuses on maintaining use-rights that are compatible with chimpanzee conservation and calls for negotiated settlements when compromises are required. It does not envisage any physical resettlement or involuntary loss of access to resources. This approach should be made explicit in the *fiche de projet*. The project will need to engage with specialists in the requirements of PS5 from an early stage and commit to not finalising Protected Area (PA) status until PS5 requirements (including compensation if required) are met. A phased approach may be appropriate to avoid creation of the whole PA being blocked by issues with some or a few villages. In the event that economic displacement was severe, this would need to be treated as physical displacement and a Resettlement Action Plan (RAP) would be required. The potential for economic displacement should be further investigated in the SEIA and appropriate	Hard, but feasible	Major	Moderate

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
	the broader context including population growth, in-migration (e.g. related to the dam and other development projects), cumulative impacts, and the situation in the surrounding region (including across the border in Mali). A human rights assessment should be included.		monitoring should be put in place to verify the effectiveness of mitigation measures.			
		Economic displacement that is not managed by compensation/livelihood restoration measures may result in people moving their residence either at household or settlement level. This is not forced eviction but the results are similar.	Compensation/livelihood restoration measures are required that, at minimum, maintain livelihoods. The effort likely to be needed to maintain livelihoods for many households/communities, over such a large area where scope for endogenous economic growth is limited will be a major challenge and an experienced partner will be required.	Challenging	Major	Major
		Some local authorities and communities may have high development aspirations, especially in relation to the planned Koukoutamba dam project. Any impression that the conservation project is responsible for non-arrival of expected gains could turn a significant portion of the local	A careful communication strategy will be required, ideally jointly from the conservation project and the dam developers. Local authorities and communities will need to perceive early benefits from the conservation project.	Hard, but feasible	Moderate	Moderate

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
		population against conservation.				
	Existing traditional authority structures are clear, locally legitimate and generally functional, but do not have a specific focus on natural resource management and rarely transcend the scale of a single village, or village-subvillage groupings.	Current authority structures are very hierarchical and key groups including women are not well integrated into decision-making.	An explicit focus will be required to ensure key groups can participate equitably in decision making relevant to them. This will need to be handled with cultural sensitivity to avoid backfiring. Guinée Ecologie have developed natural resource management associations led by women in other areas of the Fouta Djallon that could provide lessons learned.	Hard, but feasible	Moderate	Moderate
		Existing authority structures are focused on single villages or small groups of sub-villages under a 'village-mere'.	Through logistical support and intensive environmental education, existing institutional structures for natural resource management should be supported to scale-up; they authority would be amalgamated hierarchically to manage land and natural resources at the levels of villages, districts and secteurs. Effective examples exist from elsewhere. It will likely be more effective	Hard, but feasible	Moderate	Moderate

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
			if treated as an extension of existing authority structures rather than creating new institutions.			
Institutional / legal	Existing classified forests are largely 'paper parks' that do not have active management and in some cases lack clear local legitimacy.	Over-emphasis on the legality rather than local legitimacy of resource use within classified forests could create unnecessary conflicts.	Assess existing claims and uses of the classified forests transparently and give them due consideration. Co-management can help to avoid conflicts and increase legitimacy and local support. Despite the lack of active management, the Classified Forests retain higher forest cover than areas outside and it will be important to develop approaches that built on this.	Feasible	Moderate	Minor
	Many legal designations for protected areas in Guinea are ambiguous in providing flexibility towards local uses that are compatible with conservation such as those currently allowed within classified forests.	Choice of an inappropriate model could create local resentment with little gain for conservation.	Explicitly define conservation objectives prior to protected area gazettement and identify the appropriate (mix of) options for legal designation. Ensure zoning is appropriate and balances the needs of local communities and wildlife conservation.	Feasible	Moderate	Minor

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
			Ensure zoning takes into account socio-economic parameters such as customary use and linkages between villages.			
	Legal designations for protected areas in Guinea are ambiguous about land tenure subsequent to PA creation.	This could create significant risks of conflict with local communities if not addressed pre-emptively.	Explicitly include mention of land tenure in the *Arrêté temporaire de classement* that will launch the PA creation process. Update *fiche de projet* with appropriate wording around land tenure to pre-empt potential conflict with local communities. Include a PS5-aligned land tenure assessment early in planning protected area creation. This should explicitly include consideration of land tenure security, future access to land, and customary tenure and use rights.	Hard, but feasible	Major	Moderate
	There is a minimal presence of authorities charged with regulating natural resource use and controlling illegal natural resource activities. The Direction Nationale des Eaux et Forets (DNEF) staff that are currently present are under-trained, under-supervised and under-resourced (NB these staff are not	Although it may be tempting to scale up enforcement rapidly, this can create a backlash against conservation if not widely perceived as legitimate and proportional.	The *fiche de projet* includes plans to bring in specific National Park staff (OGUIPAR) rather than the general DNEF staff who are currently present. Take a long-term approach: It will be important not to rush into increased law	Feasible	Moderate	Minor

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
	affiliated with the MBPA project). These authorities are widely perceived locally as corrupt and with limited capacity and legitimacy.		enforcement until the legitimacy and procedures for doing so are clarified and widely accepted locally. Careful targeting (intelligence-led enforcement) is essential. Good practice models exist from elsewhere. A significant increase in the number and capacity of staff will be required. A significant training, support and monitoring programme will be required, including a component on human rights. Co-management and independent monitoring can help to avoid such conflicts and increase legitimacy, governance and local support.			
Financial	Although unit costs (salaries, per diem etc.) for operating in Guinea are low and even modest investment can lead to significant conservation or development outcomes, the area is very large, with many villages so logistical and transaction costs are likely to be high. Overall costs for managing the protected area are	Required budget and rate of expenditure will be high, even compared to previous large-scale conservation and development projects in Guinea. Several previous donor projects in Guinea have	Ensure the implementing team includes a partner with experience managing large complex conservation projects with high burn rates. Envisage a scaling-up period.	Feasible	Moderate	Minor

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
	estimated to be in the range $35m-64m for 20 years. This is not out of line with either the costs of offsets elsewhere nor the scale of investments being made or planned by CBG and GAC.	suffered from financial mismanagement.	Establish good practice financial oversight as a core part of offset institutional set-up.			
		The cost of implementing development activities in so many villages could be very high.	A model including a significant micro-credit component rather than simply grants could be an efficient use of resources. This needs to be embedded within an ecological sustainability framework, to prevent potential negative impacts of micro-credit. Guinée Ecologie's community forest projects have trialled this approach in the Fouta Djallon. Engaging a rural development partner with experience in micro-credit and learning from the experience of Guinée Ecologie and others in Guinea and elsewhere would help planning an appropriate approach.	Hard, but feasible	Moderate	Moderate
Political	GoG has shown willingness to integrate conservation and development in this landscape, as evidenced by the mandate given to WCF to prepare a protected area creation process and by the creation of an interministerial commission to address issues	Although a compromise integrating the planned Koukoutamba dam in the new protected area and for seeking sites outside Moyen Bafing for potential offsets for the dam has been floated, this has yet	WCF is working with the GoG (including at Presidential level) to seek clarity in the form of a compromise agreement. A statement of intent in the *Arrêté temporaire de classement* and strategy, and eventually an MoU between the different parties would provide greater	Feasible, but further assurance required	Critical	Moderate

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
	of compatibility between conservation, mining and hydropower projects.	to be confirmed as an official GoG position. Further, the extent of planned local development activities associated with the dam project is not clear; if it includes extensive agriculture, it could significantly increase dam project impacts on chimpanzees. Likewise potential resettlement impacts of the dam are unclear at this stage.	assurance that conservation and development activities will be compatible and meet required standards for an offset. It will also be important to understand political dynamics at the Prefecture and village level (and engage as appropriate).			
Additionality	There are no active conservation activities in the landscape and wider area is not currently gazetted. There is no indication that funding from companies would displace other conservation funding from this site. Although threats are currently relatively low, they are likely to increase and be significant over the next 20 years; by reducing these current and future threats the offset can result in gains that would not otherwise have occurred, i.e. gains that are 'additional'.	No significant challenges requiring addressing at this stage.		Suitable	Minor	Minor

Feasibility component	Main findings	Key challenges	Options for addressing challenges	Overall assessment of feasibility / suitability	Risk assessment (inherent risk)	Risk assessment (residual risk after mitigation)
Opportunities for scaled offset and/or aggregated offset	Population of c. 4,400 chimpanzees is sufficient for at least GAC and CBG as long as Koukoutamba dam impacts are well managed. There is enthusiasm amongst project stakeholders and other institutions to make an aggregated offset a success Co-financing may be available due to the leadership nature of this project.	Institutional structures for aggregated offsets do not exist in Guinea and will need to be designed from scratch.	Effective models exist from elsewhere and both IFC and WCF have begun to consider potential models.	Feasible	Moderate	Minor
Possibility of additional conservation outcomes	Good potential for additional conservation outcomes. Potential for a large protected area in a part of Guinea that does not currently have any strictly protected (IUCN categories I-IV) areas. Few highly threatened species other than chimpanzees, though potentially relict populations of Lion and Western Derby's Eland that could recover. Possibility of trans-boundary initiatives with Mali (as originally planned under the Bafing-Falème project).	No significant challenges requiring addressing at this stage.		Suitable	Minor	Minor

1 Introduction and objectives

1.1 Overview and purpose

This report assesses the feasibility of implementing conservation in the Moyen Bafing landscape in Republic of Guinea to provide a biodiversity offset for chimpanzees. This landscape forms part of the Fouta Djallon, which is considered the most important landscape in Guinea (and one of the highest priority areas globally) for conservation of the Critically Endangered Western Chimpanzee (Kormos & Boesch 2003). The Office Guinéen des Parcs et Réserves (OGUIPAR) and Wild Chimpanzee Foundation (WCF) are working together towards the creation of a c. 7,000 km^2 protected area for conservation of c. 4,400 chimpanzees and other wildlife in this landscape.

It is based on a number of inputs including socio-economic and chimpanzee population data provided by WCF, the conservation model presented by WCF and OGUIPAR in the Fiche de Projet, and a field visit carried out by TBC, INSUCO and OGUIPAR in January-February 2017. A full socio-economic assessment or consultation with local communities is outside the scope of this report.

The feasibility study comprises three main elements:

- First, we evaluate the feasibility of implementing a successful chimpanzee conservation project in the Moyen Bafing landscape against key feasibility criteria (ecological, socio-economic, institutional and legal, financial, and political), including an assessment of the 'red flags' identified in the pre-feasibility study.
- Second, we assess the suitability of Moyen Bafing as an offset with reference to good international industry practice for offsets, over and above the feasibility of delivering conservation gains discussed above. Specifically, we consider: tangibility of conservation gains, including the expected permanence of gains and questions of uncertainty and risk; additionality and leakage; stakeholder engagement; monitoring and evaluation; and, opportunities for an aggregated offset.
- Third, we map out the next steps for offset implementation at this site, including initiatives to deliver early gains, stakeholder engagement plan, and a roadmap for offset implementation.

1.2 Scope, exclusions and assumptions

This report is intended primarily for CBG and GAC, including their (potential) financiers and Project stakeholders, and is subject to the following exclusions, limitations and assumptions:

- The report focuses on assessing the feasibility of implementing an offset for chimpanzees and does not cover other Critical or Natural Habitat (and associated biodiversity features) that may also require offsetting. Some of these issues are addressed briefly in Section 4.6.1 but a detailed consideration is outside the scope of this report.
- It is based on a number of inputs including socio-economic and chimpanzee population data provided by WCF, the conservation model presented by WCF and OGUIPAR in the Fiche de Projet, and a field visit carried out by TBC, INSUCO and OGUIPAR in January-February 2017. A

full socio-economic assessment or consultation with local communities is outside the scope of this report.

2 Background to Moyen Bafing and the protected area project

2.1 Context

The Moyen Bafing landscape forms part of the Fouta Djallon, a mountainous area located in the centre of Guinea. The habitat is a transitional woodland-grassland mosaic that extends into the dry Sudanian savanna vegetation towards Mali. There are also agricultural and fallow lands, however large areas still remain difficult to access which has limited the rate of habitat loss and degradation.

The Fouta Djallon includes three administrative regions (Labé, Mamou and part of Boké). The proposed MBPA overlaps slightly with another administrative region, Faranah that belongs to Haute Guinea (Figure 2), however the socio-economic and environmental conditions of the Moyen Bafing are characteristic of the Fouta Djallon.

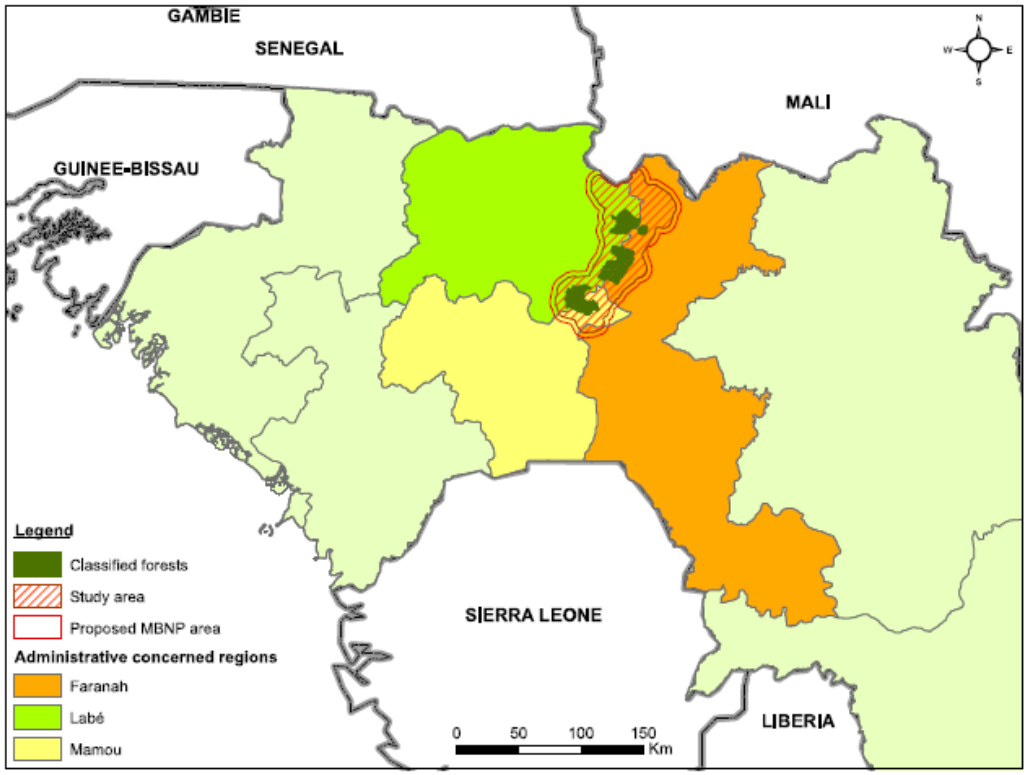

Figure 2: Location of the WCF study area for the proposed Moyen Bafing Protected Area in central Guinea (WCF 2016a)

The Fouta Djallon is the second most densely populated region of Guinea, after Guinea Maritime (United Nations World Population Prospects). The main ethnic group is the Fulani, which are mostly pastoralists and agriculturalists (Kormos *et al.* 2003). This ethnic group, and the majority of people living

in the Fouta Djallon, are Muslims and thus possess religious taboos against killing and eating chimpanzees. A questionnaire-based study conducted by Ham in the mid-nineties reported that only 6% of the subprovinces in the Fouta Djallon eat chimpanzee meat, compared to 47% of subprovinces in Guinée Forestière (Ham 1998).

The Fouta Djallon is considered an 'exceptionally important priority area' for the conservation of the Western Chimpanzee given the high chimpanzee density that has been recorded in this region due mainly to a low hunting pressure (Ham 1998; Kormos *et al*. 2003). It could potentially be harbouring the largest remaining population of this subspecies. It also encompasses a portion of the transboundary Manding Plateau, another 'exceptionally important priority area' for the conservation of chimpanzees in Senegal, Mali and Guinea. This area appears therefore highly suitable for chimpanzee conservation.

2.2 The Moyen Bafing protected area project

The Wild Chimpanzee Foundation (WCF) conducted a nationwide chimpanzee survey in 2009-2012 in order to better understand chimpanzee distribution and abundance throughout Guinea, and to support GAC in locating a suitable offset site to compensate for their residual impacts on chimpanzees (WCF 2012). These surveys confirmed the great potential of the Fouta Djallon landscape for chimpanzee conservation, and helped guide subsequent surveys in an area of high chimpanzee density that included seven existing Classified Forests.

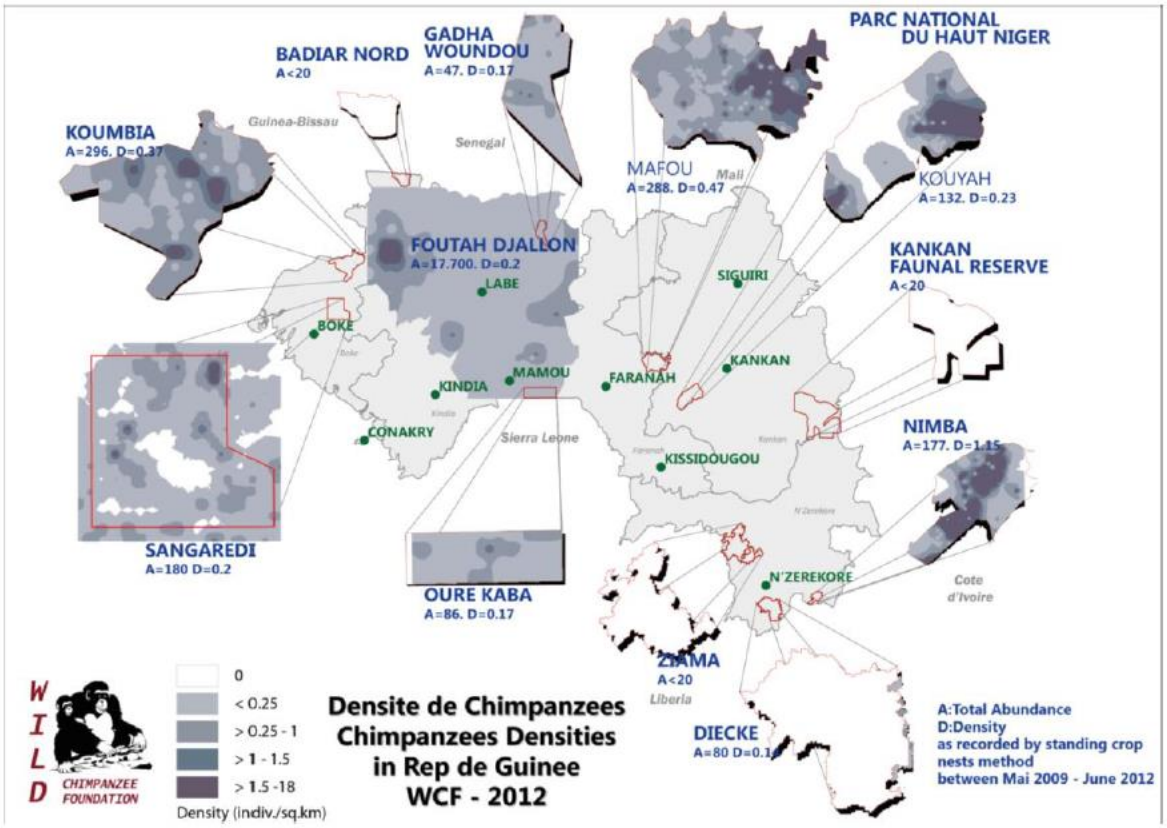

Figure 3: Results of the WCF nationwide chimpanzee survey indicating a chimpanzee population of c. 17,700 chimpanzees for the Fouta Djallon (WCF & OGUIPAR 2015)

A more detailed survey was conducted in 2013-2014 in a c. 8,000 km^2 area, confirming the large number of chimpanzees in Moyen Bafing (WCF 2016b). Shortly after, WCF and the Office Guinéen des Parcs et Réserves (OGUIPAR) presented a project to support the conservation of chimpanzees in this area through the creation of a protected area that could protect over 4,000 chimpanzees as well as other wildlife. An official mandate was given to OGUIPAR and WCF by the Minister of Environment, Water and Forests to proceed towards the protected area creation in November 2015[3]; this mandate was renewed in April 2016. The key steps to date and the currently planned next steps are summarized in Table 2 below.

The indicative zoning is included in the initial project plan ("Fiche de projet") based on studies anterior to 2015. The proposed protected area would encompass an area of c.7,000 km^2 and be composed of three different zoning systems:

- A **strictly protected core area** or *Zone Intégralement Protégée* (ZIP) within which no human activity would be allowed;
- A **sustainable use zone** or *Zone de Gestion des Ressources* comprised of a 5 km around the ZIP and where sustainable resource exploitation would be allowed; and
- A **development zone** or *Zone de Développement* comprised of a 5 km buffer around the economic zone and where development activities could take place.

Further information has been collected in the Moyen Bafing landscape since initial submission of the *Fiche de projet,* and although the same zoning principles are being considered, the limits of each zone and the types of conservation activities that would be implemented within them are still being refined in the light of further data. Although the mandate and *Fiche de Projet* refer specifically to creation of a National Park, WCF and OGUIPAR have stated that the choice of protected area status is not yet fixed. The type and contours of the proposed conservation project are therefore still fluid. This assessment is therefore based on consideration of the potential to achieve chimpanzee conservation in the Moyen Bafing landscape and is not limited to consideration of the specific model described in the first *Fiche de Projet*.

Table 2: Summary of activities undertaken and planned by WCF in support of the creation of the proposed MBPA and first consultations of local population by OGUIPAR

Step achieved	Period	Description
Nationwide chimpanzee survey	2009-2012	Understand chimpanzee distribution and abundance throughout Guinea (WCF 2012). Identify priority areas for chimpanzee conservation.
First chimpanzee survey within the proposed MBPA (8,000 km^2)	2013-2014	Collect more detailed data on a targeted area that was selected based on results from the nationwide survey (WCF 2016b).

[3] In early versions of the Fiche du Project the proposed protected area is referred to as Haut Bafing. This was changed to Moyen Bafing to avoid confusion with a different conservation project being implemented by Guinée Ecologie.

Step achieved	Period	Description
Elaboration of a *Fiche de projet* and initial mandate from Ministry of the Environment to proceed with protected area creation	November 2015	Proposal for the creation of the Moyen Bafing National Park (WCF & OGUIPAR 2015).
Second chimpanzee survey in proposed MBPA	2015-2016	A second chimpanzee survey encompassing a larger survey area to refine understanding and provide a basis for selecting the limits of the future protected area (WCF 2016b).
Biodiversity and Responsible Mining Roundtable	June 2016	Meeting held between the Ministry of Mines, Organisation pour la Mise en Valeur du fleuve Sénégal (OMVS), Ministry of Energy, WCF and Oguipar to discuss a broader partnership for the creation of a protected area in Moyen Bafing and highlight the presence of an important chimpanzee population in the area chosen to implement the Koukoutamba dam .
Further field studies completed	2016	Two further studies were completed, a focus group study (WCF 2016c) and a demographic survey (WCF 2016a). These studies were undertaken in order to understand the local use of natural resources, human-chimpanzee interactions and the perception of the local people towards the creation of a protected area. It also serves to map all the villages within the proposed MBPA, to understand their size, origins and how they are linked.
First consultation of local communities (OGUIPAR)	2016	Presentation of the protected area project and awareness raising about deforestation, protection of forest and preservation of water has taken place in 3 governorates, 5 prefectures and 15 sub prefectures (commune rural)
Socio-economic survey	January 2017 – on-going	A socio-economic survey launched focusing on a sample of villages within the proposed MBPA in order to better understand social aspects that could influence the conservation model, including local reliance on natural resources, main sources of income and land tenure.
Signature of an *Arrêté* for the creation of an inter-ministerial commission (IMCMB) for discussing issues related to the proposed MBPA	February 2017	An *Arrêté* was signed (République de Guinée 2017) to facilitate communication between the Ministry of Environment, Water and Forests, the Ministry of Mines and Geology, and the Ministry of Energy and Hydraulic, OMVS and local communities to discuss issues related to biodiversity conservation and sustainable development in the Moyen Bafing Landscape.
Second consultation of local communities (OGUIPAR)	April 2017 – on going	The presentation of the project and the importance of the area for conservation based on all studies will be presented to all the villages and prefectures included in the proposed zonation of the protected area. The zonation type will be explained too, as well as the potential benefits (direct and indirect). (c.80 meetings)
Development of a Strategy to reconcile the creation of a protected area and the	On-going	A Strategy has been proposed to include the Koukoutamba dam within the proposed MBPA to ensure an effective management of its

Step achieved	Period	Description
development of a hydroelectric dam in the same area	(currently being reviewed)	impacts. It is also proposed that this project would offset its impacts to chimpanzees elsewhere within the Fouta Djallon.
Workshop for the delimitation of the proposed MBPA	May 2017	A workshop on 8th May 2017 between Ministry of Environment, Water and Forests (MEEF), WCF and the Inter-Ministerial Commission for the Moyen Bafing (IMCMB) defined the provisional zones and the boundaries of the future Moyen Bafing National Park (MBNP).
Arrêté temporaire de classement	On-going (initial draft currently being reviewed)	An *Arrêté temporaire de classement* will be signed once the broad location of the limits have been agreed upon by the Ministry of Environment, Water and Forests, the Ministry of Mines and Geology, and the Ministry of Energy and Hydraulic, OMVS and local communities.
Protected area creation process	Once *Arrêté temporaire* is signed	Full process of consultation, land-use planning, participatory mapping, financial and institutional set-up, SEIA and community consent leading to proposal of final protected area status and implementation via legal instruments.

2.2.1 Terminology

As discussed above, the limits of the proposed protected area have not yet been precisely defined and different WCF reports refer to different areas as study areas. In this report we use the following definitions:

- We refer to the broad landscape including the study areas and proposed protected area as "Moyen Bafing".
- When referring specifically to the planned protected area we use "proposed Moyen Bafing protected area" (MBPA). This is synonymous with the conservation project proposed by WCF and OGUIPAR (WCF & OGUIPAR 2015) and includes the proposed completely protected core area and adjacent sustainable use zones (which are not yet clearly defined).
- When referring to the specific areas in which data was collected by WCF we use the term "Moyen Bafing study area", qualified with the year and study, e.g. 2014 Moyen Bafing chimpanzee study area. These areas are described in WCF (2016b, 2016a).

2.3 History of conservation in Moyen Bafing

The proposed MBPA is not the first conservation project to operate in Moyen Bafing. There are already protected areas (classified forests) that have been gazetted, and different projects that have been operating in this landscape over the last c. 20 years.

2.3.1 Classified forests

The seven classified forests in Moyen Bafing were created in the colonial era. They are all recognized by the Direction Nationale des Eaux et Forets (DNEF), however they possess different legal status (Table 3). Five of them possess an *Arrêté de classement*, one (Sobori) has only a project for an *Arrêté de classement*, and no information could be retrieved for Bakoum Classified Forest.

Table 3: Summary of the status of the seven "classified forests" in Moyen Bafing

Classified Forest	Area (km^2)[1]	Date gazetted	Specification	Additional Allowed uses for the adjacent villages[2]
Bakoun	280 **c.310**	1955: Arrêté No. 3110 SE/F of 25/04/1955	• Hunting not allowed	• Acquired right to existing banana plantations and rice crops along streams and rivers which provide natural conditions for this cultivation (wetlands). • Livestock grazing • Honey harvesting without using fire or cutting trees. • Collection of bamboos and straw to be used for local construction material
Bani	189 **c.240**	1952: Arrêté No. 357 SE/F of 16/01/1952	• Hunting not allowed	• Livestock grazing • Collection of bamboos to be used for local construction material
Boula	215 **c.270**	1955: Arrêté No. 4091 SE/F of 31/05/1955	• Hunting not allowed • Three enclaves listed: Boula, Lakino and Kobaméré	• Rice cultivation by villages surrounding the classified forest • Livestock grazing • Collection of bamboos and other construction materials
Darou-Salam (Dar-es-Salam)	175 **c.190**	1953: Arrêté proposed but not signed	• Hunting not allowed • Three enclaves listed: Sinséry, Darou-Salam and Boubé	• Livestock grazing • Collection of bamboos and lianas for local construction material • Honey harvesting without using fire or cutting trees.Access to existing cultivated areas located within the classified forest was granted for two years
Dokoro	78 **c.85**	1952: Arrêté No. 3565 SE/F of 07/06/1952	Listed as a gazetted forest by the DNEF	No information available
Sobori	59 **c.54**	1956: Listed as classified on 30/04/1956	• Listed as a gazetted forest by the DNEF • Only seen the project for an *Arrêté de classement*	No information available
Bakoum	**c.162**	No information available	Listed as a gazetted forest by the DNEF	No information available

[1]Values provided according to the *Arrêté de classement*, with values in bold derived using the GIS layer for classified forests.

[2] Right of use for all the classified forests were "Collecting dead wood, harvesting fruit, food and medicinal plants" according to the "avant projet de décret de Sobori"

2.3.2 Integrated Conservation and Development Projects: PEGRN

The Projet Elargi de Gestion de Ressources Naturelles (PEGRN) was a classic Integrated Conservation and Development Project funded by USAID that ran from 1999- c.2004 around Bakoun Classified Forest. It was modelled on a project that had previously supported the development of co-management for Nialama Classified Forest. Project activities included:

- Physical delimitation of the classified forest;
- Inventories of wildlife (Coumbassa & Gauthier 2005) and other natural resources, including timber;
- Development of a management plan (Bah *et al.* 2005) ;
- Creation of forest management committees;
- Enforcement of hunting and natural resource management regulations;
- Measures to control erosion (bunds);
- Measures to control fire (including firebreaks in some areas);
- Helping villages develop local land-use and development plans (Plans de Gestion des Terroirs Villageois - PGTV)
- Implementation of development projects, including beekeeping, market gardening, agro-forestry.

The former project base camp still exists in Kouratongo, and has been adopted by local authorities. A number of key technical staff are still present in the area, pursuing their own agricultural or natural resource management projects, but activities ceased with the end of funding and the institutions that were created are now dysfunctional (see page 72).

A review of the project in 2001 concluded that it had significant design flaws due to misinterpretations of local ecology and socio-economic systems, poor quality data collection and incoherent planning between conservation and development objectives (Catterson *et al.* 2001). It is not clear whether or how these were addressed in subsequent years.

2.3.3 AGIR and the proposed Bafing-Falémé transboundary conservation area

The EU-funded project Appui à la Gestion Intégrée des Ressources Naturelles (AGIR) started in 2000 with the aim of strengthening transboundary cooperation in natural resources management. A c. 17,775 km^2 transboundary protected area with Mali was proposed as part of this project, the Bafing-Falémé Transboundary Protected Area (UICN-PAPACO 2008; Evaluation METT: Aire Protégée Transfrontalière Guinée-Mali 2009).

Field surveys were carried out during this period, improving our knowledge on the biodiversity of this area. In particular, chimpanzee surveys conducted in Mali and Guinea revealed the high potential for chimpanzee conservation in this area (Granier & Martinez 2004).

The AGIR project ended in 2005, and the proposed transboundary protected area had still not been officially proclaimed. No activities continued on the ground, and the infrastructure built as part of this project are now used by the DNEF.

2.3.4 Other conservation projects

A number of other conservation and sustainable development projects have operated in the area, usually on a scale of one or a few villages. These include:

- Guinée Ecologie's community forest project. This project seeks to conserve chimpanzees by working with local communities to create and conserve community forests. It has the ultimate aim of creating a World Heritage Site in the wider Fouta Djallon. It has one site near Kouratongo in the north-west of Moyen Bafing.
- A 2015-2016 restoration and conservation project from the Cercle de Recherche et d'Actions pour le Développement Durable (CRADD) in the area of Bakoun Classified Forest supported by GEF Small Grants Programme from the UNDP.

3 Study questions and methods

This section briefly summarises the questions that the feasibility study aimed to answer, and the key components of feasibility and offset design principles against which the suitability of Moyen Bafing as an offset site was judged. A variety of different methods were used to address specific questions and components of feasibility (ranging from remote-sensing habitat modelling to socio-economic field visits and interviews), details are given in the relevant Sections and/or in the Appendices. The assessment is subject to a number of constraints and limitations, as discussed in Section 1.2

3.1 Conservation feasibility assessment

We assessed the feasibility of implementing a successful chimpanzee conservation project in the Moyen Bafing landscape against key feasibility criteria (ecological, socio-economic, institutional and legal, financial, and political). The kinds of questions we asked under each criterion were as follows:

- **Ecological feasibility** (Section 4) – Are there are enough chimpanzees (and chimpanzee habitat), and is it theoretically feasibly to generate tangible conservation gains in a reasonable time-frame? (e.g. is there a potentially sufficient population growth rate and are there current or future threats that could plausibly be reduced in order to generate gains?)
- **Technical feasibility** (Section 5) – Are there potential conservation (or integrated conservation and development) interventions that could plausibly deliver conservation gains at the required scale, e.g. that have a track record of success in similar situations and at similar scales?
- **Socio-economic feasibility** (Section 5) – how and whether conservation gains could be generated in an appropriately equitable and sustainable manner given the cultural and economic context and in manner acceptable to broader stakeholders and rights-holders.
- **Institutional and legal feasibility** (Sections 6 and 7) – What are the institutional and legal constraints to implementing conservation in Bafing and how could they feasibly be overcome? What kind of governance measures need to be put in place?
- **Financial feasibility** (Section 8) – are the costs of delivering conservation gains realistic given the potential order of magnitude of offset and donor funding and the potential absorption capacity of the implementing agencies / communities?

3.2 Specific offset requirements

Following the conservation feasibility assessment, we evaluated the suitability of Moyen Bafing as an offset with reference to good international industry practice for offsets, over and above the feasibility of delivering conservation gains discussed above.

Good practice principles that we used to guide our assessment are described in Table 4, and include *inter alia* ecological equivalence, additionality, use of a precautionary approach, long term outcomes, stakeholder involvement, and transparency[4]. Given the particular status of chimpanzees, we also considered two additional offset principles (TBC 2015, 2016):

- Accepting only offsets that are likely to result in a stable or increasing population of chimpanzees (rather than slowing declines) so that the offset demonstrably contributes to an overall improvement in chimpanzee conservation; and
- Ensuring that the offset is at a sufficiently large spatial scale that partial failure would not compromise the entire site (and, in circumstances where this condition is not met, considering the use of additional 'insurance' sites to mitigate against the risk of failure)

Table 4 : Outline of key good international industry practice principles for biodiversity offsets (adapted from BBOP 2012a with reference to ICMM & IUCN 2013 and CSBI & TBC 2015)

No.	Principle	Description
1	Adherence to the mitigation hierarchy	All appropriate avoidance, minimization and on-site restoration measures will be implemented or explored and reasonably ruled out.
2	Equivalence	Biodiversity gains from offsets must be 'like for like or better'.
3	Limits to what can be offset	There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected.
4	Landscape context	Offsets should be designed to consider connectivity across the landscape, avoiding fragmentation, and maintaining flows of ecosystem services.

[4] These principles are based on those developed by the multi-stakeholder Business and Biodiversity Offsets Programme (BBOP 2012a), informed by other industry guidance (ICMM & IUCN 2013; CSBI & TBC 2015) and incorporate the general requirements for use of offsets as part of the mitigation hierarchy under PS6.

5	Net gain	A biodiversity offset should be designed and implemented to achieve *in situ*, measurable conservation outcomes that can reasonably be expected to result in a Net Gain of biodiversity over a reasonable timeframe.
6	Additionality and leakage	Conservation gains will be clearly attributable to the Project's actions and will demonstrably be above and beyond results that would have occurred if the offset had not taken place.
7	Precautionary approach	Estimates of gains and losses will be conservative and include a margin of precaution proportional to the risks involved in offset delivery.
8	Long-term outcomes	Biodiversity offsets should use an adaptive management approach, incorporating monitoring and evaluation, to secure outcomes that last at least as long as the Project impacts. Securing long-term finance is essential to ensuring permanence of the offset.
9	Stakeholder participation	Offsets will be based upon appropriate, extensive and transparent stakeholder consultation.
10	Transparency	The design, implementation and monitored outcomes of biodiversity offsets will be transparent, and communicated in the public domain.

3.3 Lender requirements

Since CBG are financed by IFC and GAC is pursuing this offset feasibility assessment in expectation of receiving IFC finance, the feasibility of aligning with IFC performance standards was an important consideration in this assessment. They key standards considered[5] are:

- IFC Performance Standard 1 on Assessment and Management of Environmental and Social Risks and Impacts (IFC 2012a); and
- IFC Performance Standard 5 on Land Acquisition and Involuntary Resettlement (IFC 2012b);
- IFC Performance Standard 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources (IFC 2012c);
- OPIC's Environmental and Social Policy Statement (OPIC 2010), specifically the categorical exclusion on project-related resettlement involving more than 5000 people.

PS5 is clear that impacts of off-site actions such as offsets are within the scope of PS5, and this is made explicit in footnote 20 of Guidance Note 5 (IFC 2012d).

[5] Other Performance Standards will be considered, as appropriate (for example, if cultural heritage sites are found that may require application of Performance Standard 8 on Cultural Heritage).

This feasibility study is not a detailed assessment of whether and how the project could align with these performance standards, but rather an assessment of whether there are any potential "showstoppers" or reasons why the offset project simply would not be able to comply with these requirements.

3.4 Assessment of particular risks (potential 'Red Flags')

A set of potential 'Red Flags' were identified in the offset pre-feasibility studies carried out for CBG and GAC (TBC 2015, 2016), specifically:

- Offset may require significant resettlement which would not comply with lender's requirements
- Potential gains may be limited if the chimpanzee population is actually not threatened
- Dams planned on the Bafing River reduce chimpanzee population below minimum population required for an offset

The method used in the feasibility study to assess each of these 'Red Flags' is summarised and results are presented in Section 10.1.

4 Ecological feasibility of chimpanzee conservation in Moyen Bafing

Summary of key findings:

Moyen Bafing supports a very large population of c. 4,400 Western Chimpanzees, probably the largest in the world.

There is an ongoing deforestation and degradation that over the long term poses a threat to the chimpanzee population.

Hunting of chimpanzees is currently a relatively low threat, but could increase rapidly and significantly if access to the area improves.

The planned Koukoutamba dam will have significant impacts on chimpanzees. However, assuming a reasonable degree of management of indirect impacts, it would not necessarily compromise the integrity or overall conservation significance of the landscape for chimpanzees, nor the suitability of the landscape as an offset.

Other potential or planned developments (roads, hydropower, mining exploration) are unlikely to have significant impacts in the short- to medium-term.

4.1 Background and basis for this assessment

This section reviews the ecological feasibility of delivering conservation gains for chimpanzees in Moyen Bafing. A focused review of key existing data and the following additional analyses were conducted:

- Review and gap analysis of WCF chimpanzee and socio-economic data;
- Rapid quantification of deforestation/degradation based on a remote sensing analysis;
- Modelling potential impacts of the Koukoutamba dam on chimpanzees.

4.2 Chimpanzee population status

4.2.1 Summary of WCF data

4.2.1.1 Chimpanzee population size

WCF collected extensive data on chimpanzee abundance and distribution in the Moyen Bafing landscape in 2014 and 2016, over an area covering approximately 8,858 km^2 (WCF 2016b). The surveys followed the standard line transect method which is robust as long as key assumptions are not violated (Kühl *et al.* 2008). Our review of this data (Appendix 8) showed that these assumptions were not violated and that, with a few limitations, the data are suitable and appropriate for offset planning.

Combining observations recorded in 2014 and 2016, and using a site-specific nest decay rate, WCF estimated the chimpanzee population of Moyen Bafing at 4,365 chimpanzees (3,533-5,393) for an area of 8,858 km^2 (WCF 2016b). This estimate indicates that Moyen Bafing potentially harbours the largest known population of chimpanzees in Guinea and the largest population of Western Chimpanzees in the world (Table 5).

Table 5: Comparison of Western Chimpanzee abundance in Moyen Bafing and priority sites for which data are available.

Site	Area (km^2)	Abundance (all ind.)	Density (all ind./km^2)	Source
Guinea				
Moyen Bafing study area	8,858	4,365	0.49	(WCF 2016b)
Haut Niger National Park	554	480	1.02	(Fleury-Brugière & Brugière 2010)
Mont Nimba Nature Reserve	60	32	0.54	(Granier *et al.* 2014)
Côte d'Ivoire				
Taï National Park	5,300	635	0.06	(WCF 2016b)
Liberia				
Sapo National Park	1,248	1,517	0.86	(Tweh *et al.* 2014)

4.2.1.2 Chimpanzee distribution

Chimpanzee signs were recorded throughout the landscape, with a greater concentration closer to the Bafing River (including the existing classified forests) and in the northern part of the surveyed area, towards the Mali border (Figure 4). WCF have conducted no statistical comparison between the classified forests and the remainder of the landscape, but it is clear that significant numbers of chimpanzees occur outside the classified forests. Although at a large scale, chimpanzees appear less abundant in the areas of highest human population density to the west and east, this may partly be due to habitat quality, since at a finer scale, high nest densities occur in close proximity to villages.

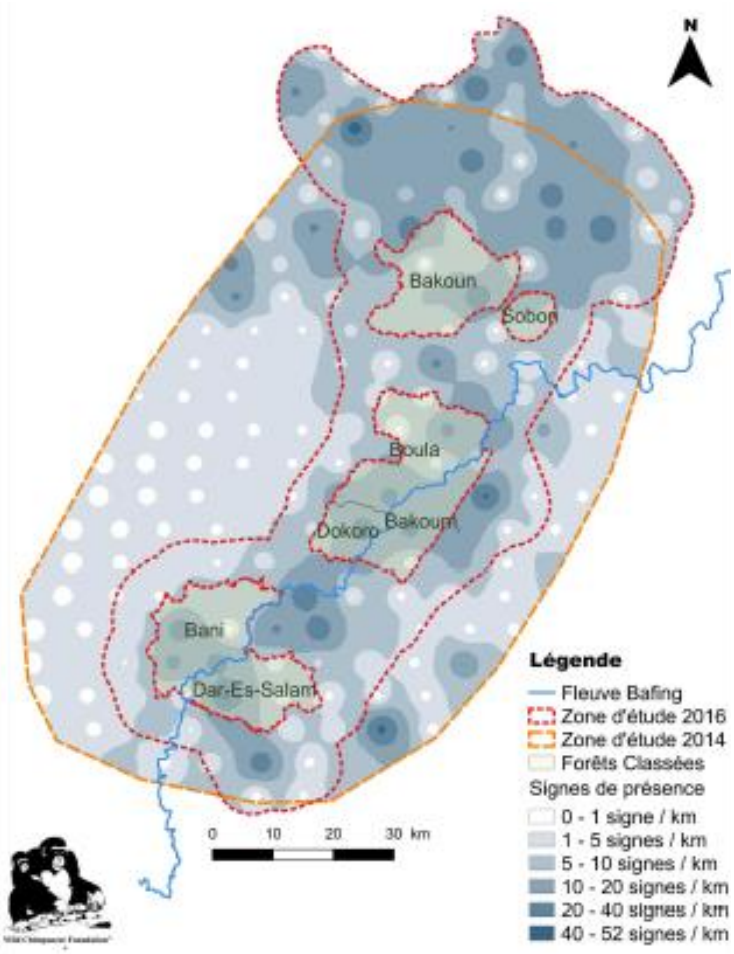

Figure 4: Interpolated map of chimpanzee signs recorded during the 2014 and 2016 WCF line transect surveys (WCF 2016b). Note that is map is a visualisation of the underlying data and is not a map of chimpanzee density

4.2.2 Rapid field assessment

A rapid field visit was made to the northern and southern portions of the proposed MBPA, including in Bakoun Classified Forest (Appendix 4). Our observations support the data collected by WCF, mainly showing that chimpanzee signs are found throughout the landscape including in very close proximity to villages (c. 200m), demonstrating the coexistence between chimpanzees and humans in this area. Interviews suggested that local people are tolerant of chimpanzees due to their religious beliefs that prohibited them to kill and eat chimpanzees, and that there is currently minimal conflict between chimpanzees and humans (for example chimpanzees are not reported to be an important crop raiding species).

4.2.3 Gap analysis and next steps

The WCF dataset provides an excellent basis for broad-scale conservation planning and with the further analysis planned by WCF (including development of a spatial model taking into account vegetation types, altitude etc) can be used to guide finer scale conservation planning. Once the limits have been set and agreed upon with the local communities, another more refined survey design can be developed for

the MBPA (e.g. stratifying the survey design by different habitat types, taking account relative suitability of different habitat types for chimpanzees) in order to establish the long-term monitoring of conservation effectiveness.

4.3 Current threats to chimpanzees

Three main anthropogenic threats were recorded during the 2014 and 2016 WCF surveys: 1) habitat loss and degradation, 2) hunting, fishing and non-woody forest product exploitation, and 3) general habitat disturbance. Signs of anthropogenic activities were more prevalent towards the southern part of the Moyen Bafing landscape, and outside of the existing classified forests (Figure 5).

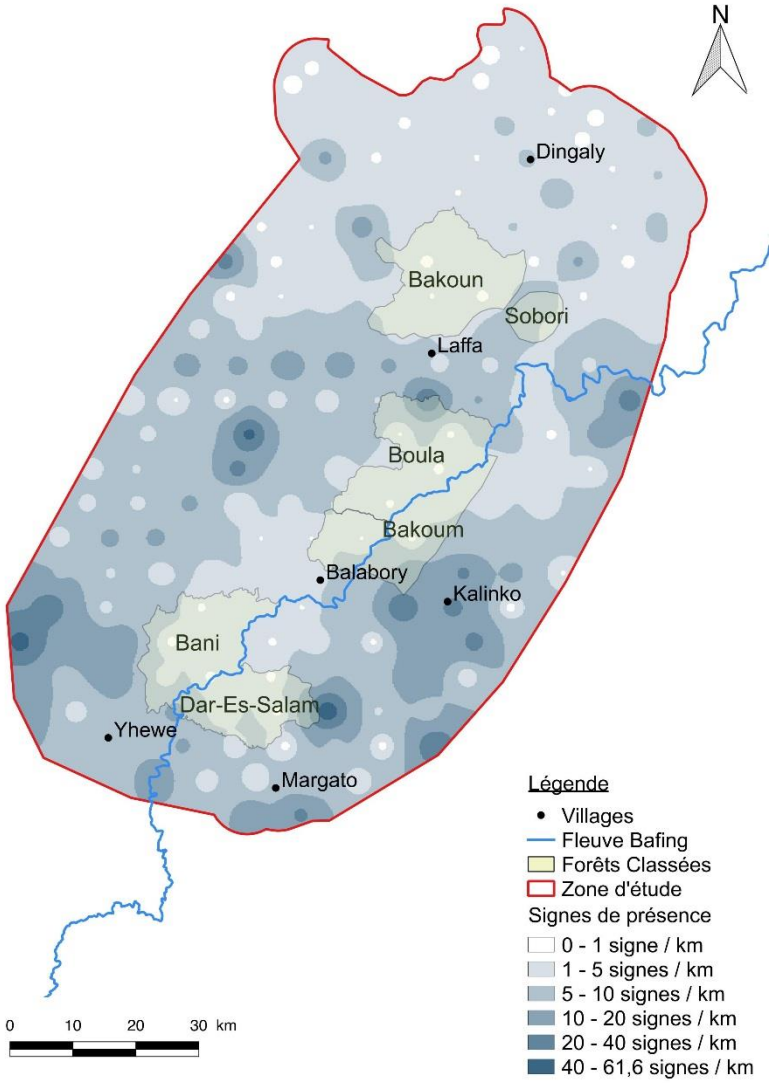

Figure 5: Interpolated map of signs of anthropogenic activities collected by WCF during the 2014 and 2016 line transect surveys (WCF 2016b)

The management plan for Bakoun Classified Forest (Bah *et al.* 2005) also identified livestock raising and commercial logging for species such as *Afzelia africana* which is also used by chimpanzees for nesting and feeding as minor threats.

4.3.1 Habitat loss and degradation

Habitat loss and degradation was the most frequently recorded threat to chimpanzees in WCF's 2014 and 2016 surveys (WCF 2016b), accounting for c. 44% of all signs of anthropogenic activities. These signs were mainly associated with clearing for agriculture and small-scale felling of trees (for example to gather construction materials). Although the WCF data provide useful information on the distribution of such threats, assessing the significance of this for chimpanzees requires a longer-term perspective.

A rapid assessment of deforestation and degradation rates in the Moyen Bafing landscape was therefore conducted using satellite remote sensing (for further details see Appendix 3). Satellite radar images were acquired for each year between 2007 and 2016 and interpreted to produce an estimate of above ground biomass in each year.

A change analysis showed that the net rate of loss of high biomass forest[6] was quite low about 0.2%/yr in 2006-10 and 0.3%/yr in 2010-16. However, rates of degradation of high biomass forest[7] were higher at 0.9%/yr in 2007-10 and 1.6%/yr in 2010-16.

Loss of high biomass forest occurred throughout Moyen Bafing, but with concentrations in the north-west, west and south-east. The rate of deforestation was measured to be lower inside the Classified Forests than outside them (although this does not necessarily imply that the Classified Forests are managed effectively, it may simply be attributable to the lower human presence in these areas).

These results are an indicative guide to rates of change rather than a precise assessment since no ground plots were available to provide site-specific calibration. However, the estimates were generated using a model developed from a similar landscape elsewhere in Africa, which concluded that a widely applicable general relationship exists between above ground biomass and L-band backscatter for lower-biomass tropical woody vegetation (Mitchard *et al.* 2009).

These results therefore indicate that over the previous 10 years, there is an on-going net loss and degradation of high biomass forest in Moyen Bafing. Chimpanzees are adaptable, but they do show a preference for nesting in higher biomass areas, which also contain important food trees. If these rates of forest loss and degradation continue over long periods, they are therefore likely to lead to a reduction in the chimpanzee population.

4.3.2 Hunting

Few signs of hunting were recorded during WCF's surveys (WCF 2016b). Combined signs of hunting, fishing and non-woody forest product exploitation accounted for c. 12% of all anthropogenic activities

[6] Defined as forest >145Mg/ha biomass declining to <40Mg/ha biomass.

[7] Defined as forest >145Mg/ha that declined to between 40 and 80 Mg/ha biomass.

recorded and were found throughout Moyen Bafing, but with concentrations in the west and east and fewer in the classified forests and the northern section of the landscape. WCF reports that hunting signs may have been under-represented given that this activity can be seasonal (the survey data only collected information at a certain point in time).

At the moment, signs of hunting are not known to be directed towards chimpanzees, the local population being in majority Muslims and thus possessing beliefs against killing and eating chimpanzees. However, villagers did report incidents of hunters from outside the area operating hunting camps for export of bushmeat (see Section 5). Increased accessibility to Moyen Bafing could facilitate access for hunters coming from different regions of Guinea that do not possess the same taboos against the killing of chimpanzees. This threat could therefore potentially become highly significant given that chimpanzees and other primates are the most abundant animal group in this landscape, and thus could become the target of external hunters.

4.4 Potential future threats to chimpanzees

4.4.1 Potential impact of proposed dams on chimpanzees

In its master plan, the *Organisation de Mise en Valeur du Fleuve Sénégal* (OMVS) identifies three potential hydropower dams in the Moyen Bafing : Koukoutamba , Boureya and Balassa (OMVS 2011a) (Figure 6). Koukoutamba, Balassa and Boureya are included in the list of four to be developed as a matter of priority, in principle before 2025. These three planned projects have different potential impacts on the proposed protected area:

- The planned Koukoutamba dam and reservoir is within the southern part of the Moyen Bafing proposed protected area and was identified as a potential 'red flag' for offset development due to 1) the large size of the reservoir in the core of the proposed protected area and 2) the fact that the reservoir would flood parts of two classified forests which have high chimpanzee densities.
- In contrast, the potential impact of the Boureya dam is much smaller, does not include impacts on existing classified forests, and is on the periphery of the proposed protected area so the reservoir area could potentially simply be excluded from the proposed protected area.
- The planned Balassa dam is outside the proposed protected area, and is not expected to have a direct negative impact.

This report therefore assesses the impact of the planned Koukoutamba dam in more detail.

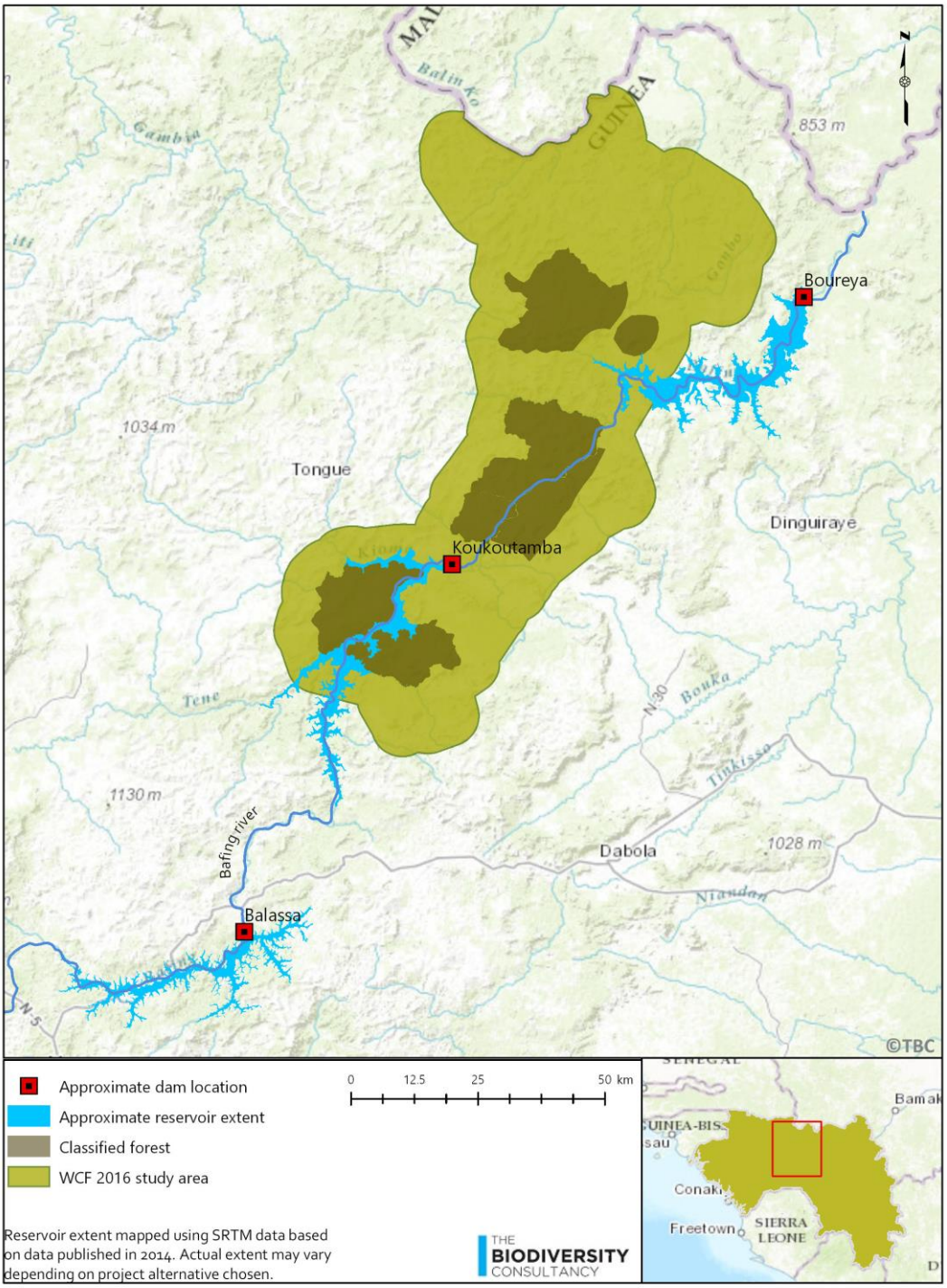

Figure 6: Proposed location of Balassa, Koukoutamba and Boureya dams and indicative maps of their reservoirs. Based on data summarised by Tractebel Engineering (2015). Final designs have not been selected so final reservoir extent may vary.

4.4.1.1 Koukoutamba hydropower dam

The Koukoutamba dam is seen by OMVS as the highest priority of the two planned dams in Moyen Bafing. A feasibility study was completed in 2012, and an SEIA launched in 2017. Technical bids for construction have been reviewed by OMVS and financial assessment is imminent. OMVS expects construction to begin by the end of 2017, but acknowledge that the funding model used (bidders must raise funds) means that there could be delays.

As described in the pre-feasibility study (Tractebel Engineering 2012) and according to conversations with OMVS, the Koukoutamba dam project includes:

- A 86m high dam to be constructed upstream of the *Chutes de Bafing*;
- A powerplant at the base of the dam;
- A construction and operating camp (location unknown at this point);
- Two transmission lines, to Conakry[8] and to Manatali;
- Upgrading the access road from Labé (150km from Labé-Tougué-Kollé-Kéniéoula-Koukoutamba) and (potentially) construction of a bridge over the Bafing River.

No associated irrigation or agricultural projects are currently planned by OMVS[9].

Modelling the impacts of the dam on chimpanzees

We estimated[10] that an area of c.190 km^2 will be inundated by the Koukoutamba reservoir, of which c.130 km^2 is located within the proposed MBPA[11]. The precise proportion of different habitat types that will be flooded is not known, nor whether core chimpanzee areas will be flooded. However, this area includes areas of higher biomass gallery forest and chimpanzees are recorded throughout this part of

[8] The Avant Projet Sommaire and the SEIA terms of reference both refer to a transmission line going to Labé, however according to a meeting with OMVS on 05/04/2017, the current project design is for a transmission line going south to Conakry via Balassa.

[9] Meeting with OMVS on 05/04/2017.

[10] Assessing impacts was done in ArcGIS using SRTM elevation data and based on a dam height of 86m at the location specified by the dam feasibility study (Tractebel Engineering 2012).

[11] The proposed MBPA area is here considered to be the ZIP (Zone Intégralement Protégée) plus a 6km buffer that will be the focus of conservation efforts.

the proposed MBPA (WCF 2016b) so it is reasonable to assume that the flooded area supports at least the average density of chimpanzees recorded for the whole MBPA.

Additional direct impacts at and upstream of the dam site are likely to include:

- Reduced habitat quality due to fragmentation and the barrier effect of the long branches of the reservoir, transmission line and access routes;
- Noise and general disturbance from human presence (especially during the construction and commissioning period);
- Mortality from increased chimpanzee intergroup encounters due to displacement from part of their territory, especially by the reservoir.

It is possible that there will also be direct downstream impacts due to 1) altered habitat quality due to changes in the seasonal flood regime, 2) altered habitat quality due to changes in water table, 3) changes in water temperature and quality that may affect riverine vegetation. Insufficient information is available at this stage to assess the likelihood or significance of downstream impacts. The OMVS has also indicated that there are no agricultural development activities planned in proximity to the dam or reservoir[12].

The principal indirect impacts expected are an increase in hunting and habitat loss due to in-migration and induced access. In-migration may be significant during the construction phase when many workers will be employed, which can attract to the area many people looking for work. Fewer jobs will be created during the operational phase. Induced access is likely to lead to significant increases in agricultural activity since access to markets is one of the principal factors limiting current productivity (see Section 5).

To assess the scale of potential impacts on chimpanzees, we modelled four scenarios ('optimistic' to ' worst case'). These four hypothetical scenarios are summarised in Appendix 3. For each scenario we estimated 1) direct impacts due to habitat loss (constant), 2) potential mortality due to inter-group conflicts arising from displacement of chimpanzee groups into neighbouring territories and 3) indirect impacts of hunting and habitat loss. Scenarios of indirect impacts were based on 1) the extent to which direct dam project impacts would be effectively mitigated, 2) the extent and location of accompanying local development activities, 3) the degree to which hunting would be controlled and 4) the approach taken to resettle communities affected by the dam project.

Within each scenario we estimated potential impacts based on chimpanzee densities of 0.49 individuals/km^2 (low estimate for each scenario) and 0.74[13] individuals/km^2 (high estimate for each

[12] Meeting with OMVS on 04/04/2017.

[13] For ease of interpretation, we used a density value for all chimpanzees, including unweaned babies. The WCF reports density of weaned individuals. We have included the same multiplier as WCF in the values presented here to account for the proportion of the chimpanzee population that does not built nests.

scenario). The low estimate is the average chimpanzee density estimated by WCF for the entire area surveyed in 2014 and 2016. The high estimate is a specific estimate of chimpanzee density made by WCF for the southern portion of the MBPA (WCF 2016b).

The resulting order-of-magnitude forecasts of potential impacts on chimpanzees for each scenario are shown in Table 6 below. Estimates range from c.275 to c.950 chimpanzees depending on the scenario. In all cases, there is limited data and significant uncertainty so the assessment should be treated as a forecast of the order of magnitude of potential impacts and not as precise estimate; actual impacts could be significantly greater or lower.

The number of chimpanzees impacted was estimated only for the area comprised within the proposed MBPA; the total number of chimpanzees impacted by the Koukoutamba project is expected to be greater than the values presented here since a further c.60km^2 will be inundated outside the proposed MBPA.

Table 6: Order of magnitude forecast of potential impacts on chimpanzees from the Koukoutamba dam. Note that in all but the most optimistic scenario, there is considerable overlap between the areas likely to be affected by intergroup encounters and the areas subject to indirect impacts. To avoid double-counting only the additional loss to indirect impacts is presented.

Scenario	Estimate of number of chimpanzees lost (rounded to nearest 25)			
	Mortality due to habitat loss under footprint	**Additional mortality due to intergroup encounters**	**Additional mortality due to indirect impacts (hunting, disturbance, habitat loss)**	**Total**
1	75-100	150-250	50-75	275-425
2	75-100	200-350	75-100	350-550
3	75-100	275-450	125-175	475-725
4	75-100	275-450	250-400	600-950

These estimates are order-of-magnitude forecasts since:

- There is no information available on the number of chimpanzee communities, their size and associated territory size, nor of the locations of core areas within the territories; these parameters are likely to significantly influence how chimpanzees respond to habitat loss and hence the significance of intergroup encounters.
- The model of the reservoir was produced using available data and could be significantly different if the height of the dam is adjusted during the full feasibility assessment.

- It is not clear whether the basin will simply be filled, or whether clearance of trees will be necessary or permitted prior to filling (this could markedly increase disturbance).
- There is little information about plans for the access route, the number of jobs to be created during the construction and operations phase and frequency of maintenance, which affect indirect impacts.
- The conservation model for the proposed MBPA has not been agreed on, which could also influence how the impacts are managed.

Nevertheless, these estimates are based on data on chimpanzee density collected by WCF within the area and so the range of estimates provide a reasonable and plausible guide to the potential scale of impacts from the Koukoutamba dam. The scenarios also help confirm that while there is limited scope for avoidance or reduction of the direct footprint impact without significant changes in dam specifications, there are significant opportunities to reduce indirect impacts. The Koukoutamba SEIA that is underway could help develop a more refined estimate of impacts if it provides greater clarity on these issues.

Comparison with other estimates

WCF has estimated separately the number of chimpanzees that could be loss as a result of impacts from the Koukoutamba dam (WCF 2016b). They used a 5km buffer around the dam and the reservoir (based on a minimum territory size of 25 km^2), and evaluated that c. 750 chimpanzees (ranging from a minimum of 375 to a maximum of 1,450 chimpanzees) would be lost within this impacted area. Here we present a separate assessment of the impacts of the dam on chimpanzees through different scenarios related to the potential level of impact management. The SEIA being currently conducted for Koukoutamba should provide a more precise estimate of impacts.

4.4.1.2 Boureya and Balassa hydropower dams

The Boureya dam is planned to be built approximately 30km to the east of Sobori Classified Forest in Moyen Bafing (Figure 6)., with an access road from Dinguraye to the south (OMVS 2011b) The reservoir would cover c. 250km^2 (OMVS 2011c), but only the upper reaches would cover the area of Moyen Bafing studied by WCF and OGUIPAR. This will include an area to the south of Sobori Classified forest in what WCF and OGUIPAR refer to as the 'northern corridor'. No data on chimpanzee density are available for the majority of the area planned to be inundated.

While there may well be significant direct impacts on chimpanzees from the reservoir, these are mostly outside the proposed Moyen Bafing protected area, and the limited areas within could easily be excluded during protected area zoning without compromising the integrity of the landscape for chimpanzees. Indirect threats to chimpanzees in Moyen Bafing due to the access route and resettlement for Boureya could potentially be important, but if protected area management is established well in advance, they should be manageable.

The Balassa dam is located some 40km south-west of the southernmost limit of the proposed MBPA, with the reservoir extending away from the protected area (Figure 6) and is not anticipated to have any direct impacts on the MBPA; it could possibly have some indirect impacts but these would be less likely to be substantial owing to the distance from the proposed PA boundary, and as for Boureya, if protected area management is established well in advance any such impacts should be manageable.

The planned Boureya and Balassa dams are therefore not considered to have a significant bearing on the feasibility of establishing a chimpanzee offset in Moyen Bafing.

4.4.2 Potential impacts of mining and other planned and foreseen developments

There are four mining exploration licenses and one mining concession that overlap with the proposed MBPA (Figure 7). The mining concession belonging to the Société de Bauxite de Dabola-Tougué (SBDT) has the largest overlap extent with the proposed MBPA and thus present the most significant risk. WCF estimates that c.800 chimpanzees (566 to 1,168 individuals) could be lost if we would assume total habitat loss in the proposed MBPA area that overlaps with its concession limits (WCF 2016b). This area also overlaps with the Koukoutamba dam project and its impacted area. Therefore the number of chimpanzees that could be lost if both mining and dam projects proceed is not cumulative.

The SBDT is owned at 51% by Iran and by 49% by the Guinean government. In 2015, the convention between both countries was renewed for another 25 years. However, there has not been any major activities conducted at this site for several years. When discussing with the Chamber of Mines in Conakry, the SBDT was not on the list of projects that were active in 2017. Given that there is no current plan to develop this project further in the near future, this threat has been assessed as being of lower risk to the proposed MBPA.

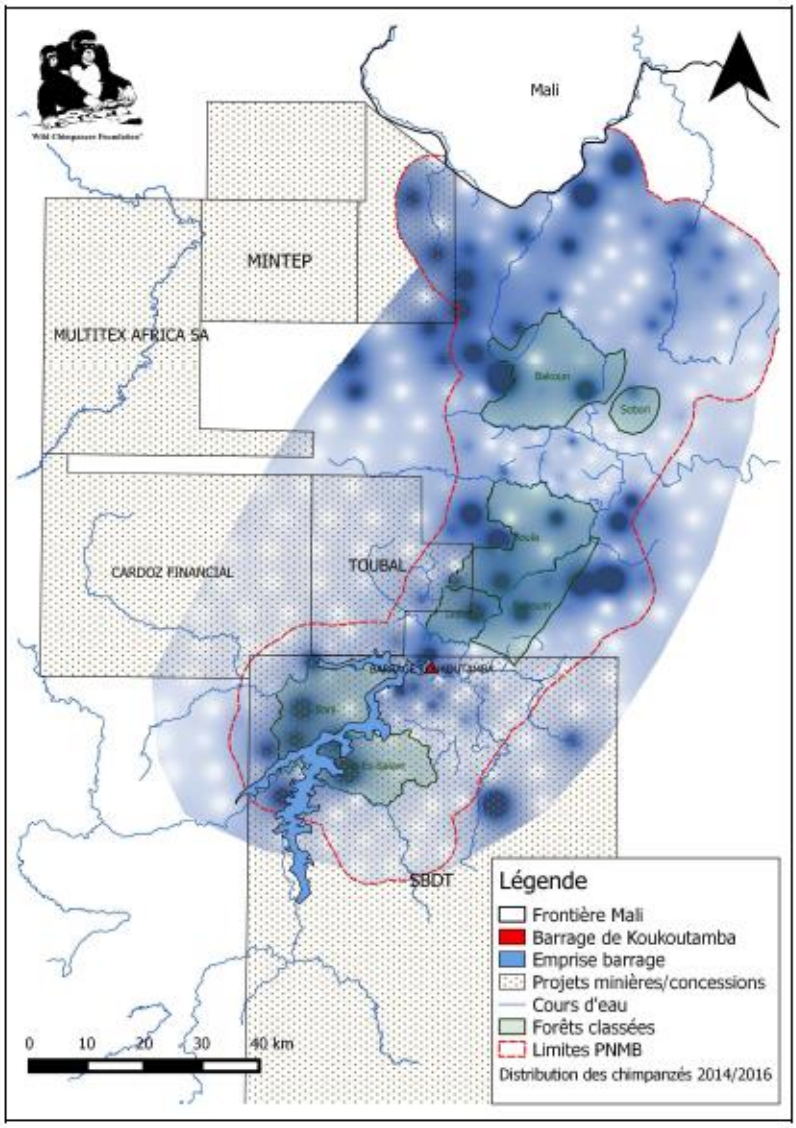

Figure 7: Visualisation of the overlap between mining projects and the proposed MBPA (WCF 2016b)

Apart from SBDT, the other exploration licenses pose less significant risks as these companies have not been yet granted permission to exploit their resources. The Irish firm Anglo-African Minerals, which owns the Mintep and Toubal exploration licenses, has been the most active in the region and has recently completed an Environmental and Social Impact Assessment for their Toubal license. They also intend to apply for an exploitation permit at the end of 2017 (Africa Mining Intelligence 2017). However, local authorities in Tougué and Kollé were not aware of any active mining companies in this region, and the Chamber of Mines in Conakry did not report this project as being one of the main bauxite project at the moment, especially given its more remote location and thus that infrastructure needs to be built to be able to transport the ore to a port location. As part of this study we tried to contact Anglo-African Minerals to understand their current and planned activities in this area, but they did not reply to our request for information.

Threats from mining companies in this region were therefore assessed to be potentially significant but not immediate. The main overlap of the proposed MBPA is with the SBDT concession which is not active

at the moment, and the other mining licenses have not yet entered an agreement with the government for the exploitation phase. There is also a possibility to adjust the limits of future concessions once these companies are ready to apply for their exploitation permit. It is also possible that these projects will not proceed further if they cannot secure funding for their activities.

The Ministry of Mines has been included in discussions concerning the proposed MBPA and as they are represented in the Interministerial Commission for Moyen Bafing (République de Guinée 2017), will also be represented during the process of identifying appropriate zoning for the proposed protected area. This provides reassurance that the threats from mining can be addressed, though ideally greater assurance would be provided, for example in the *Arrêté temporaire de classement* for the proposed protected area., in which case they would not prejudice the ability to establish effective chimpanzee conservation in the landscape.

4.4.3 Potential impacts of planned upgrade to the Labe-Mali road

A project to upgrade the road from Labé to Mali was identified as a potential threat to this area during preliminary information gathering as part of this study. However, after stakeholder consultation and gathering further information on this project, it was assessed that this was not an imminent threat since there is no concrete plan to develop this project and no funding has been secured yet for the construction of this road. This threat will need to be monitored as if this project would be realized, there would be an increased accessibility to the area which would facilitate the export of wood products, potentially leading to more rapid degradation of chimpanzee habitat. At the moment it seems unlikely that this project will proceed in the near future, and thus that the construction would happen before the creation of the protected area, and therefore was not identified as a significant risk.

4.5 Potential size of a chimpanzee offset

Table 7 below presents the 'available' starting chimpanzee population for an offset, assuming that the Koukoutamba dam is the only one of the potential development impacts to have a significant impact on chimpanzees. Even under the worst scenario evaluated for Koukoutamba, Moyen Bafing would still offer the opportunity to protect a population of 3,600 chimpanzees, which would still be the largest in the world. Under challenging but realistic scenarios for management of the dam impacts, the starting chimpanzee population could be greater.

Table 7: Estimated chimpanzee population size within the proposed MBPA (based on WCF data) under the different management scenarios of the Koukoutamba dam presented above.

Modelling impacts from the Koukoutamba dam	Chimpanzee population size[14] (individuals)
No Koukoutamba project	4,365 (3,533-5,393)

[14] Based on WCF biomonitoring data (WCF 2016b) .

Scenario 1	4,000 (3,100-5,100)
Scenario 2	3,900(3,000-5,050)
Scenario 3	3,750 (2,800-4,900)
Scenario 4	3,600 (2,600-4,800)

4.5.1 Counterfactual scenario for offset design

The GAC and CBG pre-feasibility assessments were both based on an assumption of a 1%/yr background rate of loss of chimpanzees. This value represents only impacts of hunting and habitat loss from agriculture, fuelwood and charcoal and does not take into account future direct impacts of from industrial development in the region (including mining and hydroelectric dam) which are estimated separately.

This was a rough estimate based on the regional rates of decline that led to Western Chimpanzees being classified as Endangered, and national estimates of deforestation. Since those assessments were conducted, the status of the Western Chimpanzee was raised to Critically Endangered based mainly on the dramatic population decrease recorded in Côte d'Ivoire and Ghana (Humle *et al.* 2016). This equates to an average annual rate of loss of c.6.5% across the range of Western Chimpanzees over the last 20 years (Sop *et al.* n.d.).

The data collected for this study indicate that a 1%/yr background loss rate remains a reasonable, and probably precautionarily low, basis for offset planning over a 20 year period, because:

- The rate of complete loss of high biomass forest is comparatively low (0.3%/yr) and hunting of chimpanzees is does not currently seem to be intense. The current rate of loss is therefore likely to be much less than the regional average.
- The relatively high rate of forest degradation (0.9-1.8%/yr depending on the parameters used) is likely to lead to comparable reductions in the chimpanzee population over the long-term.
- Hunting and especially habitat loss seem to be limited by the difficulty of access to the area, which is likely to increase significantly over the 20+ year life of an offset.

4.6 Broader conservation value of Moyen Bafing

4.6.1 Other species of conservation concern

Twenty-eight other species of large mammal were recorded from the proposed MBPA during WCF surveys, of which three are threatened (VU) but none are highly threatened (WCF 2016b). No targeted surveys were conducted to assess the potential presence of other species of conservation concern, species that would probably occur at a lower density and would therefore require further survey effort to assess their presence in this area. Based on previous studies conducted in this region, WCF estimated that there could be a total of 44 species of medium-large mammal present in this landscape based on their data (transects and camera traps) and data from the Pan-African Program of the Max Planck Institute (camera traps). From these accounts, it is possible that the African Lion (*Panthera leo*), which is Critically Endangered in West Africa, and the Critically Endangered Western subspecies of Derby's Eland (*Tragelaphus d. derbianus*) are still present in the Moyen Bafing landscape.

Little information is available on non-mammalian species of conservation concern that may be present in the region. No other CBG or GAC Critical Habitat qualifying species have been confirmed present.

Conservation measures for chimpanzees would not necessarily automatically result in the protection of these species but in general measures to protect habitat and limit hunting could lead to improved conservation status for other species in the landscape.

4.6.2 Opportunities for transboundary conservation with Mali

This landscape forms part of the Fouta Djallon, which is considered an 'exceptionally important priority area' for the conservation of the Western Chimpanzee, and is potentially harbouring the largest remaining population of this subspecies (Kormos & Boesch 2003). It also encompasses a portion of the transboundary Manding Plateau, another 'exceptionally important priority area' for the conservation of chimpanzees in Senegal, Mali and Guinea.

In 2000, an initiative was launched as part of the AGIR program to create a transboundary protected area with Mali (17,500 km^2, including 10,000 km^2 in north eastern Guinea and 7,500 km^2 in south western Mali), the Bafing-Falémé landscape. During the development of this project, chimpanzee surveys were conducted on the Guinean and Malian sides of this proposed protected area and revealed the high potential for chimpanzee conservation (Granier & Martinez 2002). Similar chimpanzee densities were found as those that were recorded by the WCF for the proposed MBPA, and other threatened species were reported to be present in this area, including the Western Black-and-White Colobus (*Colobus polykomos*), the Critically Endangered Western subspecies of Derby's Eland and the African Lion, which is also Critically Endangered in West Africa.

Although we observed signs of the previous presence of this project (infrastructures, posters and road signs), funding was not renewed after the end of the AGIR program in 2005 and activities ceased with the end of the project.

4.7 Summary of ecological feasibility

The evaluation presented in this section can be summarised as:

- Moyen Bafing supports a very large population of c. 4,400 Western Chimpanzees, probably the largest in the world.
- Chimpanzees are found across the landscape and in very close proximity to villages.
- There is an on-going net loss and degradation of high biomass forest that over the long term poses a threat to the chimpanzee population.
- Hunting of chimpanzees is currently a relatively low threat, but could increase rapidly and significantly if access to the area improves.
- The planned Koukoutamba dam will have significant direct impacts on chimpanzees, and if poorly-managed, significant indirect impacts also. While these could be significant for the southern portion of the landscape, assuming a reasonable degree of management, it would not compromise the integrity or overall conservation significance of the landscape for chimpanzees, nor the suitability of the landscape as an offset.

- The planned Boureya dam will have minor direct impacts on chimpanzees within Moyen Bafing, that can be taken account of in protected area zoning. Indirect impacts of the Boureya dam, especially in-migration, could increase pressures on the north-east of the landscape. This could require enhanced conservation presence in this sector of the landscape but would not compromise the integrity or overall conservation significance of the landscape for chimpanzees, nor the suitability of the landscape as an offset.
- The potential Labé-Mali road upgrade does not appear imminent; protected area creation could provide a basis for managing potential impacts of this road upgrade if and when it occurs.
- Despite the presence of several exploration permits and concessions, mining is unlikely to occur in the near future due to the difficulty of access compared to other areas of Guinea. Unmanaged impacts of mining would be significant, but appropriate zoning during protected area planning could reduce them.
- Even taking account of the likely impacts of the Koukoutamba dam, Moyen Bafing offers an opportunity to protect a starting population of over 3600 chimpanzees which is ample for an offset.

5 Socio-economic feasibility

Summary of key findings:

Moyen Bafing is a human-dominated landscape; although there are areas of lower population density. Villages make strong traditional claims to land, in some cases including within the existing classified forests.

Socio-economic features of Moyen Bafing that may work in favour of conservation include: explicit local acceptance of chimpanzee presence, strong and functional traditional authority structures, generally clear traditional land tenure and local control over decision-making about land- and resource-use, limited commercial exploitation of natural resources and relative remoteness from markets.

Socio-economic features that may make conservation more challenging include: the large number of people spread across numerous small villages, potential scarcity of fertile agricultural land (especially 'bas-fonds'), sometimes hostile attitudes to existing classified forests, high local development aspirations in at least some cases, and no existing traditional institutions explicitly for natural resource management.Whilst addressing these issues will be challenging, there is no a priori reason to think that it will be impossible to address them and achieve effective conservation of chimpanzees given sufficient commitment, time, resources and an adaptive approach based on a recognition of local land and natural resource rights and focused on long-term outcomes.

Key principles for the conservation project (such as no involuntary resettlement) and how they will be achieved should be made explicit in an updated Fiche de Projet to provide greater assurance that an appropriate approach will be followed.

5.1 Background and basis for this assessment

This chapter examines the social and economic contexts of the Moyen Bafing and assesses the implications for the feasibility of implementing chimpanzee conservation. The area proposed for increased protection is home to tens of thousands of people who have lived in close proximity to the area's chimpanzee population for centuries, pursuing largely agriculturally-based livelihoods, also raising livestock, hunting and collecting wood and non-timber forest products. Depending on their proximity to markets and roads, and the quality of these roads, they are more integrated or less integrated into a cash economy. Their social and normative structures are based on customary practice and Islam, with relatively low influence of the State in rural areas and higher influence in towns and cities.

Based on WCF's data, observations made during TBC's visit and specialist input from INSUCO (Appendix 1) supplemented by available literature, this section summarises the main aspects of local demographics and the economy, social structures and conditions, and traditional and formal (i.e. the State's) authority systems, including how they interact. The socio-economic survey currently being carried out by WCF will provide a more detailed and comprehensive understanding of these issues.

This section also assesses how local social conditions could be harnessed to support the proposed landscape-level chimpanzee conservation initiative. In addition, the approach being proposed by WCF and OGUIPAR is flexible and fluid, and although the initial *fiche de projet* and mandate focuses on a three-zone model with a core national park (WCF & OGUIPAR 2015), the final conservation model will be evidence-based, informed by the on-going studies being conducted by WCF. This section is therefore not an assessment of a single proposed conservation model but rather identifies the key issues that a conservation programme would need to grapple with and assesses whether there are potential solutions for addressing them, drawing on the wealth of experience with conservation elsewhere (e.g., Blom *et al.* 2010; Blomley *et al.* 2010). It also assesses where uncertainty exists and further information would be useful, some of which may become available from WCF's on-going surveys.

5.2 General socio-economic context

5.2.1 Population size and distribution

According to WCF's demographic study of November 2016 (WCF 2016a), c. 405 villages exist in and around the proposed Moyen Bafing protected area, with a total population of approximately 67,500 people. This population is unevenly distributed, with concentrations in the south-west around Koïn and Kolangui Sous-prefectures, around Kalinko Sous-prefecture in the east-southeast, and along the east-west road in the northern corridor (Figure 8). Outside of these population centres, the landscape is relatively sparsely populated, in particular within the classified forests.

The majority of villages are small, with fewer than 150 inhabitants each and only two villages have more than 1000 inhabitants[15] (Figure 8 and Table 8 based on WCF's 2016 demographic study)

Given that the limits of the proposed protected area are not yet finalised, and village lands have not yet been mapped, the actual population and number of villages that will need to be engaged for effective conservation is not yet established, but is likely to be a subset of the number identified by WCF's demographic study.

[15] Google earth images indicate that at least one of these two villages seems much smaller than would be consistent with a population of >1000, however the images for that area date from 2013 so it is possible that there has been recent rapid in-migration. This data needs verifying.

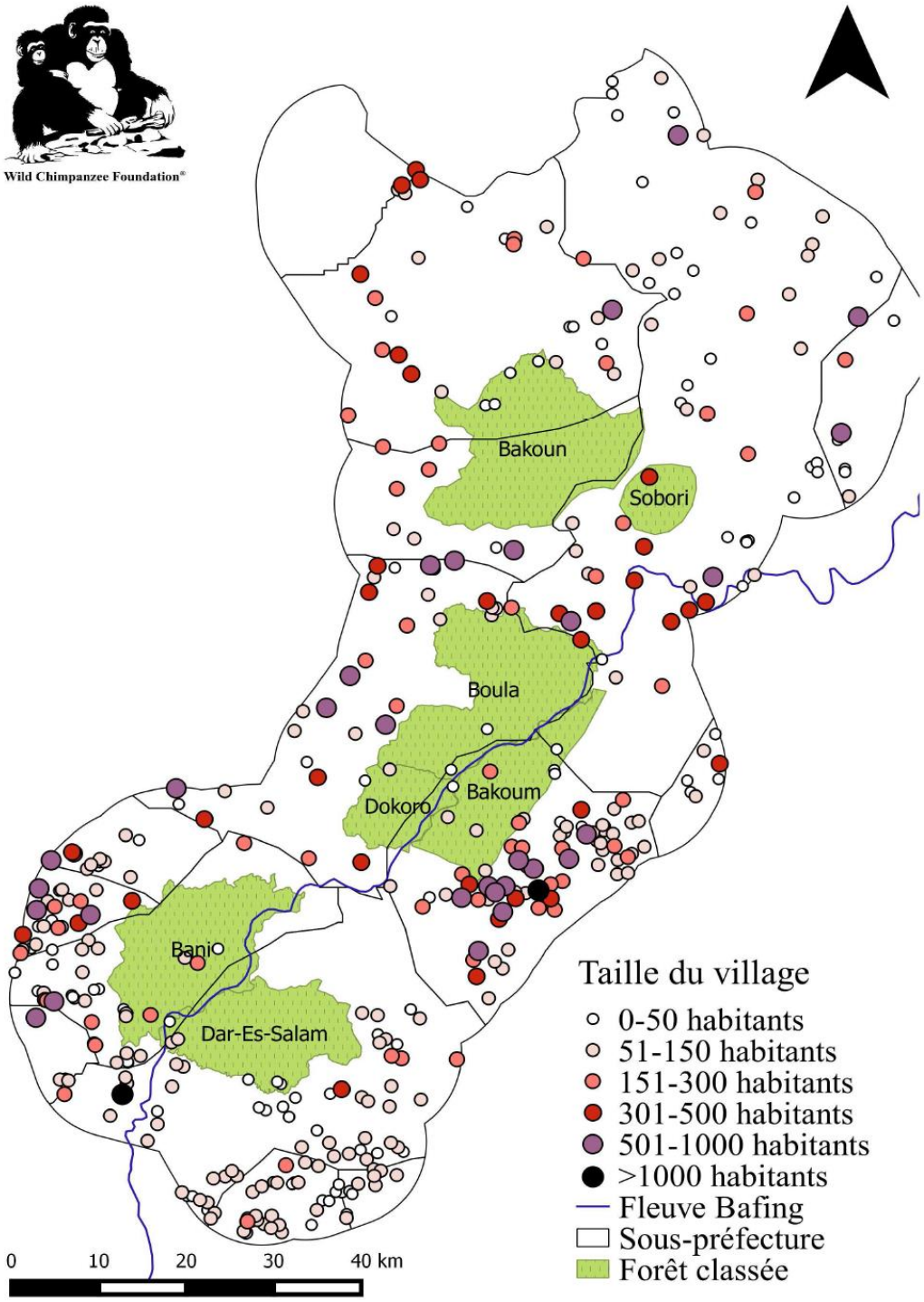

Figure 8: WCF's map of village size distribution in the area initially proposed for a Moyen Bafing protected area (WCF 2016a)

Table 8: Summary of demographic data collected by the WCF within the proposed MBPA area[1]

Area	Number of villages	Number of villages according to their population				Total number of inhabitants (rounded to the nearest 100)
		0-150	151-500	501-1000	>1000	
Inside the 7 classified forests[2]	32	30	2	0	0	1,800
Area included in the proposed corridor Nord and Sud (see Figure 10 in Appendix 4)	28	11	12	4	0	7,500
Area including the ZIP+ a 6km buffer[3]	290	190	45	20	2	50,000
In wider area considered for proposed MBPA	55					8,200
Total in study area considered for the proposed MBPA	**405**	**282**	**92**	**29**	**2**	**67,500**

1) This summary is based on demographic data collected by the WCF in 2016 over a 7,068 km^2 area (here referred to as 'study area considered for the proposed MBPA').
2) Six classified forests are formally classified, however Bakoum has an unclear legal status.
3) The ZIP is a 'Zone Intégralement Protégée' that would be the core area of the proposed PA, and a buffer of 6km around the ZIP would be the focus area for conservation.

5.2.2 Socio-economic context

Moyen Bafing falls mainly in the Prefectures of Tougué and Dinguiraye, with a small finger of Mamou Prefecture in the southernmost portion.

Tougué Prefecture is characterised by its relative remoteness: seasonally poor roads, poor communications and very little economic activity relative to other areas of Guinea. It has no active mining projects (though WCF data suggest some residents have temporary work in mining outside the prefecture), no industrial agriculture or plantations, little donor activity and no industry. It has a largely subsistence-focused economy, based on farming (rice, fonio, groundnuts), fruits and livestock raising. Exports of these products are limited by poor roads and distant demand. This has likely resulted in relatively low levels of natural resource extraction across large areas, as well as agricultural conditions that are considered marginal and conducive to neither widespread nor intensive farming. Social services are poor to non-existent in many villages, with few economic prospects beyond the traditional, subsistence-based agricultural lifestyle.

While still distant from urban centres, Dinguiraye Prefecture has both industrial and artisanal gold mining, attracting people from across Guinea and neighbouring countries and creating markets for products and services that Tougué Prefecture does not have. However, no active mining exploration or concessions operate in the area targeted by the MBPA.

Unlike Tougué Prefecture, which is predominantly populated by ethnic Peuhls (also known as Fulani), as well as Djalonkés and a few minority ethnicities, Dinguiraye is populated predominantly by ethnic Malinkés, followed by Peuhls and other minority groups.

Significant heterogeneity was observed between sous-prefectures of specific conditions like their relative connectedness to roads, markets and telecommunications, and their demographic density. Based on qualitative observation (to be confirmed by WCF's current socio-economic surveys), connectedness to good roads appears to correlate positively with demographic density and integration in the market economy.

The villages visited by TBC and INSUCO were established 4-7 generations ago, meaning the villages had been settled for well over 100 years. The old age of many villages is corroborated by WCF's demographic dataset.

5.3 Economic activities and use of natural resources

The economic activities of the Moyen Bafing are dominated by agriculture, livestock raising and use of renewable and non-renewable natural resources, with little to no industrial or intensively commercial activity apart from gold mining in portions of Dinguiraye Prefecture. The landscape surrounding villages is a mosaic of agricultural fields with more intensively cultivated areas nearer to villages, regenerating fallow including some quite old fallow (>20 years), pasture consisting of bowé and wooded savannah, and forest.

5.3.1 Agriculture is the principal livelihood activity

Agriculture is practiced in three principal forms:

- high-intensity farming of fertile soils in "*bas fonds*" which are frequently wetlands developed for perennial farming,
- high-intensity farming in gardens called *tapades*, usually in riparian zones near villages which are watered in the dry season where fertility is actively maintained, and
- extensive, unirrigated upland farming of grains and groundnuts.

Bas fonds produce irrigated crops like rice or vegetables. Tapades produce mainly vegetables and fruits, but also maize and other high-value crops. Depending on how connected a village is to a road and thus to markets, farming produce varying amounts for domestic consumption versus for sale.

Fonio, groundnuts and rice are by far the most widely cultivated crops in the area, and are grown usually in unirrigated uplands, using a slash-and-burn system followed by a fallow period of varying duration, depending on the type of soil, slope and ambient humidity. While literature on the Fouta Djallon region indicates generally decreasing fallow periods, and dangerous levels of erosion and sedimentation of water courses, this was neither observed nor cited by villagers. Land was reported to be readily available, but ***fertile*** land was widely reported as inadequate for local aspirations. In places, this has led villages to establish farms inside classified forests, such as in Bakoun and Dokoro, practices which may have pre-dated the classification of these classified forests in some locations. Villagers furthermore insisted that agricultural work is very labour-intensive – slashing fields, planting them,

fencing them, protecting them from pests, harvesting – and they do most if not all work entirely by hand. Inputs like fertilizers are too expensive, and where land is not scarce, there is little incentive to make investments to improve it (soil fertilization, irrigation, bunding, terracing) so it does not occur.

Crop losses in *tapades* to livestock or wildlife are low because they are close to or within villages, are normally enclosed, and actively supervised. Crop losses in other fields are to various wild animals including monkeys, suids, and rodents, as well as free-roaming domestic livestock including cattle. Chimpanzees were reported not to disturb crops in the villages visited by TBC and INSUCO, although crop-raiding was reported in WCF's surveys.

Some areas are protected by villagers from clearing for agriculture, like around springs and headwaters of water courses. This is variously explained as because DNEF officials advise them not to clear there, or because chimps or *djins* (local spirits) live there, or because it protects water courses. In some areas, like in the enclave inside Bani Classified Forest, elders recognise that agriculture is forbidden inside the classified forest, but this awareness is not universal.

Several elders reported that their villages are empty of young men due to an exodus towards towns (see below), causing agriculture to contract since the workforce was reduced.

5.3.2 Livestock raising is extensive

Cattle are the most important source of wealth and wealth accumulation in the region, followed by goats and sheep, followed by chickens and ducks. Pigs are not raised or eaten because the area is strongly Muslim.

Cattle are generally left free to roam to find food and water, although in the growing season they may be enclosed to limit crop damage. No systematic transhumance was reported. This extensive approach to cattle raising means that people are likely to burn bowé, fallows and forest to (re)generate pasture even in remote areas to provide their cattle with forage. It also raises the potential for conflicts with conservation since in several villages leopard predation was mentioned as an issue when cattle went into classified forests.

Overall cattle populations seem markedly lower than in areas like Badiar. The most frequently reported reason for small herds was the need to sell cattle to raise funds to deal with economic shocks, though veterinary issues were also mentioned. In general, neither pasture nor water were mentioned as constraints on cattle numbers, though in some areas, for example in the enclave inside Bani Classified Forest, owners of livestock reported limiting their herds because if they do not, livestock will roam far, get lost and possibly die. It is less a matter of consciously recognising the land's carrying capacity and adjusting herd size accordingly, but of avoiding losses.

In the areas visited by TBC and INSUCO, which are inhabited almost exclusively by ethnic Peuhl, it is usually a farmer's responsibility to fence agricultural fields to protect them. While conflicts between farmers and herders occur, the rules are generally clear and local elders resolve problems based on these rules. Because practically everyone farms, and most people also raise livestock, local conflicts are not between farmers and herders; they are between people with agricultural fields (who may also have livestock) and owners of livestock (who certainly farm as well). However, as indicated by WCF's studies,

this clarity in rules and conflict-resolution mechanisms may not exist in areas of mixed or other ethnicity.

5.3.3 Bushmeat hunting is important but wildlife is scarce

Many villages report having been founded (long ago) because of the local abundance of game. However today, game is rare and hunting is a sensitive topic in villages. Hunting is done with rifles, not snares, and sometimes with dogs. Artisanal rifles are widespread. People claim rifles are used for self-protection and opportunistic hunting while working in agricultural fields. While this is true, and is tolerated by DNEF officials, it is not a complete picture of what was observed in the field.

From observation and interviews, hunting appears to be widespread in the Moyen Bafing. While people claimed it occurs only during the daytime, it was observed at night as well when it is indiscriminate of an animal's age or gender. Hunters burn underbrush so they can see game better. Village-based hunters do not appear to hunt primates, suids or other animals whose consumption is forbidden by Islam. However non-local hunters – non-Peuhls from prefectural capitals – were observed and reported to hunt in remote areas of the FCs for sale in markets. It is not known what they were hunting; they could have been hunting both locally consumed species and species for export to distant markets where interdictions on primates and suids do not exist.

Hunting is a highly sensitive topic with villagers, who are not forthcoming in discussing what they do. People know rules apply to rifle ownership, hunting permits, areas off limits to hunting and seasonal or periodic bans on bushmeat, but neither villagers nor DNEF officials could explain these fully. However, villagers and DNEF officials were clear on which species are protected, including chimpanzees.

Villagers and authorities report universally that the density of *gibier* (game animals) has decreased dramatically over recent years, although some claimed it was in the last five years, others said in the last ten, and others said since the end of the Sékou Touré's presidency in 1984. For this reason, very few people depend on hunting as a primary livelihood. Bushmeat in the Moyen Bafing appeared to be mostly for home consumption or trade within a village, although WCF's systematic surveys will provide greater clarity. People in local markets confirmed that bushmeat is rare. It may be ordered, however: hunters will go into "high forest" to hunt and bring it the following week. Bushmeat rots if not smoked, and there are other sources of meat locally, so commercial hunting without a ready buyer is risky.

Bushmeat is largely an open access resource. Outsiders (*étrangers* – non-local commercial hunters) are not supposed to hunt without appropriate permits from DNEF, and without presenting themselves first to local elders. However village reports and field observations suggest that external hunters operate without permits or local permission, sometimes with support from highly-placed personalities – this was also reported by WCF (2016a, 2016b)and by previous studies (Catterson *et al.* 2001). Some villages reported that if they did not hunt local game, it would be hunted by the neighbouring village or *étrangers* meaning there was little point restricting offtakes to allow wildlife populations to recover.

5.3.4 Fire is an important economic tool and a source of tension

People burn land every year for multiple reasons. The two primary reasons cited are to clear fields for farming and to regenerate pasture for livestock. Secondary reasons cited were to reduce brush so hunters can see game better, and to smoke out hives for their honey.

Pre-emptive burns are permitted, even encouraged, until mid or late December to avoid wild fires at the height of the dry season. However, fires burn throughout the dry season. The agricultural calendar requires burning close to the time that crops are planted, soon before the rainy season, in April. Honey is collected in May, so associated fires start then. Fires in the dry season appear to be to regenerate pasture and for hunting.

Like hunting, discussion of fire was sensitive because it is an important source of conflict between villages and DNEF officials. If a fire happens, the person who lit it is responsible for paying a fine and for any damages caused. If an individual is not identified, the entire village is responsible. Given that nearly all bowé and vast areas of regenerating fallow and forest in the Moyen Bafing are burned every dry season, enforcement of the rules is impractical, but fires still cause tension.

DNEF officials and OGUIPAR report that fires represent a widespread, constant and highly dispersed threat to the forests of the Moyen Bafing, perhaps the most significant current threat to the zone's ecology. However, as in the rest of Guinea, fire has been used – at least to some extent - in this landscape for centuries (e.g., Fairhead & Leach 1996)[16]. Research elsewhere in Africa shows that rushing to conclusions about the destructive impacts of fire can lead to interventions that result in ineffective and even counter-productive outcomes, and that even with a considerable evidence base it can be very difficult to design appropriate interventions to meet specific community or conservation objectives (see for example Laris & Wardell 2006; van Wilgen *et al.* 2014). Given that fire management has the potential to create significant conflict with local communities in Moyen Bafing it would be prudent not to rush to conclusions about the role of fire and to adopt an evidence-based approach incorporating appropriate specialist input.

5.3.5 Fishing is principally for local consumption

While less widespread than hunting, fishing is practiced in many villages, especially those closest to the Bafing River and its larger tributaries. Because fish spoil quickly and roads are bad, fishing appears limited to local consumption in villages and export to local markets on market days. Like bushmeat, fishing is in practice an open-access resource. Fishing was another sensitive topic to discuss with villagers, presumably because of fear of response by DNEF officials (fines, permitting taxes, additional regulations).

5.3.6 Fuelwood, charcoal and timber extraction are principally for subsistence use

Four primary uses of local wood consumption appear prominent:

[16] See also p.42 of Catterson *et al.* (2001) "*The Sudano-Guinean-Congolian forest types of the Fouta Djallon are, with the exception of the forests occurring in the deep galleries, types that have evolved over the ages with fire as a constant of their ecological conditions. Fire, quite simply, cannot be avoided. And if it were, there would be a good chance that the resulting build-up in biomass would burn during a drier year—and have a much more severe impact on the ecosystem*."

Firewood: widely available in the areas around villages. Only dead wood is considered acceptable to collect; cutting live trees for fuelwood is not necessary and is frowned on. Availability of firewood varies inversely with demographic density. In sparsely populated areas, firewood was not reported as limited and its collection did not appear to put significant pressure on local vegetation. Firewood is not exported to local markets; transport is difficult so selling firewood is not profitable. Its collection should be regulated by DNEF, but this appears to occur only if it is exported by truck which is rare. Domestic consumption is tolerated without permits.

Charcoal: not produced in remote villages, and not observed in quantity in local or Tougué's market, although some is traded. Because of difficult local transport, it is not profitable to produce and export it.

Wood for fences and posts: usually harvested from agricultural fields and fallow surrounding villages. Because farmers need to protect fields from livestock, such wood can be overharvested locally, but it is usually harvested adjacent to agricultural fields. WCF suggest that in at least some parts of the region (e.g along the road to Koukoutamba) this is done for commercial reasons and sold in Labé, though this was not corroborated by TBC and INSUCO's visits to three villages in this area.

Construction wood: another locally sensitive topic. Villagers know it is supposed to be regulated, including permitting and paying taxes, and limiting total off-take to 25m^3 or 50m^3/month (reports vary). People know a procedure exists to request of the *Chef de secteur* a permit to cut wood with a chainsaw, which passes through several stages to reach the prefectural authorities, who issue a permit in exchange for payment of taxes, however this appears to be rarely applied in practice.

Based on observations and interviews of people with chainsaws, traditional houses do not use wooden planks or frames, but modern buildings do. So when someone wants to construct a modern building, (s)he requests a chainsaw operator to come and harvest wood from a village's land. The impact of such wood-cutting on local forest is not known. Given the remoteness of large trees from villages, and the difficulty of transporting planks, presently there does not seem to be any material export of planks to local markets. This was confirmed by observations in local markets where people said planks are not available without ordering in advance.

5.3.7 The issue of water availability requires clarification

While at a large scale, availability of water is clearly a determining factor in the siting and size of villages and agricultural land, TBC's field observations about the supply of potable water differed somewhat from WCF's survey results to the extent that in the seven rural villages visited by TBC and INSUCO, residents stated that the quality of local water courses was generally good for drinking, and definitely good for bathing, cleaning and livestock. Water wells are generally preferred over creeks for drinking, and are available in many rural villages. Complaints were not heard about water courses drying up in the dry season or filling with sediments today when they did not in the past. Villagers did not complain

about a decrease in water quantity or quality[17]. By contrast, WCF's survey results indicated that a reduction in water availability was a widespread concern in the 12 rural villages included in the focus group study (WCF 2016b). WCF's extensive socio-economic surveys currently underway will help to clarify conditions across the broader landscape.

5.3.8 Non-timber forest products (NTFPs) are important, but principally for subsistence use

Many NTFPs are collected, with the four most significant ones and/or those which bring people into contact, or conflict, with wildlife being reported as:

- **Honey**: wild honey is greatly appreciated by local villagers. Smoking bees from wild hives can cause bush fires, although this happens in the start of the rainy season when the risk of wild fires is lower. People make hives and perch them in trees, harvesting them in May. Honey is consumed locally, sold locally or sent to market. In some villages, adapted "Kenyan-style" hives were introduced by the PEGRN project and this technique seems widely used. Chimpanzees are reported to raid hives but if a chimpanzee succeeds in taking a villagers' hive, it is regarded as the beekeeper's fault, and no retribution is allowed against the chimpanzee.
- **Straw**: straw ("paille") is used in all traditional construction. It is harvested in the dry season and stored until needed for roof repairs or construction. Villagers recognise that bush fires destroy straw and can mobilise to extinguish a fire that threatens an area of good straw. However villagers do not consider straw to be a limited resource needing management. Although quantitative data are not available, no evidence was encountered that harvesting of straw has a significant impact on local ecosystems or causes conflicts with livestock, especially in comparison to the impact of bush fires.
- **Medicinal plants**: these were not highlighted as being economically significant, although they are used. No complaints were heard that they are declining or limited, or need management measures.
- **Wild fruits**: several were cited, including the néré fruit, shea fruit (for shea butter) and *Parkia bicolor* (African locust bean). These can be important, seasonal supplements to local people's diet and can be exchanged locally or sent to market. Villagers compete with wild animals – monkeys, chimpanzees and birds in particular – for them but this was not considered a reason to kill these animals.

5.3.9 Artisanal mining is rare

Artisanal mining was not reported anywhere in the portion of the Moyen Bafing's rivershed in Tougué Prefecture. 'Youth' from Tougué Prefecture travel to Dinguiraye, Siguri and other Prefectures of Kankan

[17] Only one village complained about its springs drying up, but this was limited to a specific area and followed an earthquake, rather than due to decreased rainfall or erosion.

Administrative Region to work as artisanal miners. WCF report that some artisanal mining occurs in the vicinity of Sobori Classified Forest in Dinguiraye Prefecture.

5.4 Local infrastructure, development projects, social services, demographics

As indicated above, the local economy is strongly influenced by local infrastructure, services and demographics. Mining and hydropower have been proposed for the region, too, which could have profound local impacts.

5.4.1 Access to markets is difficult

Roads surrounding the proposed MBPA and in the northern and southern corridors (as per the *Fiche de Projet*, November 2015) are poor and traffic is consequently limited. Tougué Prefecture has no tarred roads, and many roads were made hand and have never been graded. Motorcycles are best adapted to these roads, but can transport only small quantities of products to markets, and/or 1-2 passengers. Villages in the areas surrounding the proposed protected area are remote even by Guinean standards, with difficult access to markets.

Products produced in villages are sold at weekly markets. On the eve of market days, people bring products to main roads to catch a passing truck, or to sell to people going to market. Villagers reported making a 72-hour round-trip on foot to travel to markets. Otherwise they sell and barter products within their own and neighbouring villages. Only those products that can travel well are sent to market, for example grains and groundnuts. Perishable products must be sold or bartered locally for products that can travel well and be sent to a weekly market, often at significant cost. Cattle are occasionally sold, but must be herded for up to weeks by foot to distant markets. Goats and sheep are occasionally sold at market too, despite high transport costs.

Observations and discussions in markets at the levels of districts, sous-prefectures and Tougué Prefecture indicated that few perishable products like fresh fish and bushmeat are available; neither is construction wood. These products must be ordered in advance. Firewood is hardly sold because it is widely available already. Thus the products that remote villages could produce are generally not sold at markets because of the cost of transport, their availability and/or their perishability.

5.4.2 Local social services are very limited and frequently dysfunctional

Access to schooling is irregular across Moyen Bafing. Some villages have primary schools while others do not, or do not have a teacher for a school. Sous-prefectural capitals have primary and lower secondary schools, but the latter do not exist in many districts. Only Tougué Centre has an upper secondary school. Thus people in villages cannot progress beyond primary school without emigrating to larger towns nearby, or sending their children there.

Access to medical services is very limited in rural parts of the Moyen Bafing. People must walk or be carried many kilometres to obtain medical help, particularly when vehicles are not available to take them to clinics. This was repeatedly highlighted as worrisome to communities.

Phone networks reach many remote villages but networks are frequently uneven and unstable, and only basic phone connectivity is possible. There are no sources of power in villages and towns apart from independent generators and solar panels, both of which constitute income-generating opportunities for a few individuals in the villages.

5.4.3 A rural exodus of young men reduces the available labour pool and creates a significant floating population

In the Moyen Bafing, it is common for "*la jeunesse*" – that is, economically active men – to leave the village in search of jobs, business opportunities or simply to experience life. Village life is reported not to offer possibilities for advancement or to expand one's horizons. 'Youth' travel to places where they have a contact who serves as a base for them to seek new opportunities. Frequently people report having seasonal jobs in other places, e.g. as bakers, seamstresses, taxi drivers and mining gold. Youths that remain or return to the village are mainly those that do not have family networks enabling them to move, those who have failed elsewhere, incapacitated people or people who had to return to care for their family. Several elders reported that their villages are empty of young men, causing agriculture to contract since the workforce was reduced.

There is therefore a very significant 'floating population' who are not physically present (often for many years), but who retain claims over land and resources in Moyen Bafing, and who could return if economic opportunities arose.

Elders and youth alike said people would be welcome to settle and farm, but they do not come. This points to a broad belief in villages and towns that the arrival of more people is necessarily a good thing, adding to the prestige and prosperity of the locality. It is difficult to conceive that the arrival of new people could be problematic, for example by overwhelming traditional authority systems, natural resources, tenure and resource-use systems, local services and infrastructure. Thus the fact that a hydropower project would encourage people to the area is seen very positively.

5.4.4 Development expectations from the proposed Koukoutamba hydroelectric power project are very high

There are few current or planned development projects in Moyen Bafing, so the planned Koukoutamba dam and hydroelectric plan is the focus of attention locally. The authorities for the area in which the proposed hydroelectric power project is located – specifically the prefectural authorities of Tougué, the sous-prefectural authorities of Kollet and the District Chief of Kégnéoula – unanimously and adamantly want the project to happen. They expect it to open the area economically, bring electricity locally[18] as well as to Guinea and to several West African neighbours, and bringing employment to Tougué Prefecture in which there are very few non-subsistence activities such as active mining, industrial agriculture or plantations, industry or donor activity. All authorities insisted on the need for

[18] According to the *avant projet sommaire*, for Koukoutamba, this is not necessarily going to be the case.

chimpanzees and people to cohabit. They believe their lifestyles are not mutually exclusive, while being unanimously adamant that chimpanzees will not stop people from making progress and developing their resources.

In villages, people had heard of the dam but did not know much about it. However they strongly support it: a communal sacrifice of 101 cows occurred in late 2016 – an immense number for the people of Tougué Prefecture – in support of the project. Villagers hope it will bring jobs, road improvements and electricity. Villages visited whose *territoire villageois* overlapped with the dam's area of influence said they would be willing to resettle if required since it would be for the greater good of Guinea and West Africa, and if done in a timely manner to allow them to recreate their current lifestyles in a new place.

The area the Bafing River and two important tributaries likely to be flooded by a dam was reported to contain more intact forest than areas closer to nearby villages, as well as higher densities of *gibier* and large mammals (e.g. leopard, buffalo, hippos). The fact that a dam might impact forest of high biodiversity value was not raised as a priority by residents of the villages in the vicinity visited by TBC .

5.5 Authority structures and management of natural resources

5.5.1 Land and natural resource ownership, management authority and (un)sustainable use

Rights to land is deeply engrained in the founding history of a village. Usually the founding family or lineage of a village has 'administrative' rights to grant others the right to farm or otherwise use land it controls. The power to grant use-rights is vested in either the head of a lineage or in the council of elders for communally administered lands. *Bas fonds* and *tapades*, as highly valuable agricultural lands, tend to belong to individuals or families, while upland areas tend to be controlled by lineages or the council of elders in general. Fruit trees, plantations, artificial hives and other productive assets that require some sort of investment of work or money, are owned by individuals or families.

Land is principally managed at the scale of a village, however in some cases satellite villages have been set up within the lands of a founding village. In these cases the satellite villages still depend on the founding village (or '*village-mere*') to an extent and have closer links with that village than with others (WCF 2016a).

In contrast to agricultural land, most other wild natural resources are considered communal goods. Thus water, timber, firewood, game, fish, straw, wild fruits and other non-timber forest products are communally managed, and 'belong' to a particular community due to their existence within that community's traditional territory. Members of the community have open access to these resources. Only if someone uses them abusively or inappropriately would a head-of-family or the elders intervene. However, these resources are not open to *étrangers*, that is, people of other villages and/or commercial operators, without explicit permission from a person or body with authority in the community. The Djalonké hunters from Tougué Centre observed in Kondé Kerin's land were considered thieves. However, villages have little power to prevent others using resources from their land, especially as concerns hunting (which only requires a transient presence) which may be supported by powerful individuals from the wider region.

During the fieldwork carried out by TBC and INSUCO, people interviewed did not report viewing their actions as having "negative" or "unsustainable" impacts on the resources concerned, either individually or cumulatively, with the exception of game species of wildlife. By contrast, WCF's focus group study reported that people perceived a number of their actions as having deleterious impacts on the environment and natural resources (WCF 2016c). Whereas certain essential and commonly used resources may be scarce locally – like fertile land – traditional authorities appear focused on managing inter-personal, inter-family and inter-village conflicts, rather than on managing the resource in question.

5.5.2 Village-level authority structures

The *chef de secteur* is the highest administrative post for a village[19]. This person is the conduit of requests from the village to higher-level authorities (e.g. for permits, social services). He receives guests, attends meetings on behalf of the village, and conducts a host of other administrative duties. He is part of a village's council of elders, and is himself an elder. He works closely with local imams, who sit on the council of elders. Certain decisions are addressed more often by the *chef de secteur* in consultation with the council of elders, while "questions concerning social relations of the village" are handled mainly by imams.

The council of elders is a flexible but deeply ingrained structure in local villages and towns. It is the highest decision-making body present in a village. Its principle purposes are to maintain the traditions and values of a community and to manage conflicts between people and families. Thus its authority extends to issues of local land tenure, land use and use of natural resources, *inter alia*. It metes out justice when necessary. If someone were to kill a chimpanzee, or foreign wood-cutters were caught cutting without permission locally, for example, the *chef de secteur* would intervene and the council would decide on the appropriate way to handle the problem. Likewise the council would decide if restrictions need to be placed on water usage, or any other natural resource, although it does not actively manage these resources unless a problem arises. The council of elders (including imams) is the body that interacts with neighbouring villages' councils of elders to resolve issues like boundary disputes, sharing of common resources, disputes between individuals of different villages, and planning of joint projects and initiatives like shared road improvements or sacrifices. They seek to ensure peaceful cohabitation between people, families, lineages and villages, reasoning with people to reach consensus and avoid punishments unless someone is resistant.

Respect for authority from the village level up to Tougué Prefecture was palpable. 'Lower' people do not speak in front of people with more authority, even if they disagree. Decisions from elders are close to law; especially youth or women must obey. Youth and elders do not always share the same priorities, which could contribute to youth emigrating.

[19] This specifically refers to relatively large villages. Small villages (*hameaux*) have a '*chef de hameau*' who does not have the status of *chef de secteur* but nevertheless has authority over their small village.

This same respect for authority appears to be extended to 'experts' like government officials who come to raise their awareness about any number of topics – health, fires, forming associations for economic activities, protecting the environment and water bodies, development projects. This respect for 'expert' opinion, and the power of the elders and imams, can be fundamental building blocks for conservation actions.

5.5.2.1 Women appear to be poorly informed about natural resource management and marginalised from decision-making

Women appear highly uninformed of issues concerning the village, and are frequently not involved in decisions even when they are significantly impacted. Men make decisions and inform women when they feel women need to know. While women use natural resources, they do not appear to be involved in decisions about how such resources are managed and they do not venture far outside of the village where hunting, wood-cutting, straw collection and certain other economic activities occur. Women's perspectives and uses of natural resources should be analysed in more detail based on the results of WCF's detailed study currently underway, as the reality of women's experience and influence may be different from what it outwardly appears to be.

5.5.2.2 Social cohesion as evidenced by communal activities seems strong but is variable

Strong social cohesion and trust is frequently associated with improved likelihood of successful conservation outcomes. Although a full assessment of social cohesion was beyond the scope of this rapid assessment, people did not report lack of social cohesion being a problem and we observed several practices that may be indicative of relatively strong social cohesion:

- In most villages, people worked together to establish a barrier around the village, principally to protect *tapades* from livestock. In most villages these barriers seemed well-maintained, and respondents indicated that maintaining them was not a problem. We also observed large upland fields with a communally-erected external barrier that were cultivated by '*groupements*' of several different families who also worked together to deter crop-raiding. However, in a few villages, barriers were established only around a certain set of houses rather than the entire village – this was explained to be for improved protection, rather than any form of conflict, but may be indicative of lower trust and cohesion in some cases.
- Similarly, in many villages a *comité de gestion* exists for maintaining boreholes and water pumps. In some villages, these clearly worked very well, with pumps being well-maintained, clean and with a barrier against livestock. However, in a few villages, which were also those with separate barriers discussed above, we observed that pumps were in disrepair. This was explained as being due to people not clubbing together to purchase spare parts (rubber washers, which cost at most a few dollars). This may again be indicative of reduced social cohesion in some villages.

Our discussions therefore suggest that social cohesion is in many villages quite strong, which may provide a good basis for communal natural resource management, though this is clearly not sufficient its own, and may be less pronounced in some villages.

5.5.2.3 Local DNEF representatives have ambiguous loyalties and respect

Each village has a designated local representative of DNEF who is supposed to work with the forest guards who visit periodically. The representative transmits requests for permits to clear land and burn, register rifles, hunt, cut wood, or anything else related to the mandate of DNEF. These representatives also inform DNEF's officials of infractions. Frequently this representative is the *Chef de Secteur*, the administrative chief for the village. Observations suggested that these representatives do not fulfil policing roles consistently, and their relations with DNEF officials vary from supportive to suspicious. Given the inadequate clarity amongst villagers and DNEF officials about rules and associated fees for hunting, land clearance for farming, wood harvest (see below) and use of fire, allegations of collusion and corruption are widespread (see INSUCO's report in Appendix 1 for more details).

5.6 Previous conservation initiatives and relationship of people to their natural environment in Moyen Bafing

5.6.1 Long-term environmental trends in the Fouta Djallon

Heermans and Williams (1988) cite literature on the Fouta Djallon dating back to the previous century that discusses the supposed immense and widespread damage caused by uncontrolled bush fires, declining soil fertility, rampant deforestation and massive erosion and sedimentation of water courses. This literature reported that water courses were starting to dry out in the dry season, likely because of uncontrolled loss of forest. These ideas inspired many early development projects in the Fouta Djallon, such as the PRABV project and its successors. Some of these assertions also appear in the report on OGUIPAR's consultations in 2016 in the sous-prefectures in WCF's area for a MBPA, and there was similarly a widespread consideration of fire as destructive by DNEF officials. However Heermans and Williams question as early as the late 1980s the doomsday predictions for the Fouta Djallon, which appeared not to be coming true, at least in a rapid, catastrophic manner.

Recent climatic modelling shows a strong link between land-use and land-cover change and decreases in rainfall at a regional scale in West Africa (see for example Boone *et al.* 2016). However, the villagers met during TBC and INSUCO's field visit did not highlight these issues as a critical concern: Creeks and streams were not reported to be drying out, or full of sediments. Water quality was still good, even if well-water is more reliable. People complained of declines in soil fertility, but not that this is a new phenomenon. People complained that the work required to cultivate unfertile land is significant in comparison with the returns, and that farming is no longer an economically or socially fulfilling lifestyle. Given the amount of abandoned agricultural land observed, and even abandoned villages, 'youth' appear to seek other forms of livelihoods than agriculture. Bush fires are indeed widespread and frequent, but neither their ecological impacts nor whether fire frequency, timing or intensity is changing in the Moyen Bafing are well understood.

It is clearly not possible to assess long-term trends in such a rapid assessment. The evidence-based approach being implemented by WCF will therefore be essential for effective conservation planning.

5.6.2 Attitudes towards wildlife and chimpanzees

Based on available literature, observation, informants and inference, wildlife in the Moyen Bafing – or at least those species consumed locally – is heavily disturbed, including in the classified forests. Elders and hunters alike bemoaned the rarity of game, which they say is recent, attributing it to several factors including overhunting. Hunting is nearly impossible to control by the State's authorities for logistical reasons, and despite lip service to the contrary, local elders did not appear committed to controlling it.

As stated previously, ethnic Peuhl communities do not hunt and rarely kill 'inedible' wildlife like monkeys and suids, even though they are significant crop pests. WCF's current socio-economic surveys should clarify if this taboo differs between ethnicities.

In Tougué Prefecture, at least, in rural villages, towns and the city of Tougué Centre, people seemed universally and genuinely to accept chimpanzee presence and not see them as threats. Chimpanzees are considered not to harm people, or their crops or livestock. They occasionally raid people's beehives, and compete for wild fruits with people, but these are considered minor inconveniences.

However, rural communities did not understand how their activities could impact negatively on chimpanzees. Fire, agriculture, tree-cutting, hunting of other animals and grazing are not understood as threats to chimpanzees.

5.6.3 The PEGRN project experience

The *Projet Elargi de Gestion des Ressources Naturelles* (PEGRN[20]) was active around Bakoun Classified Forest from 1999-c.2004. It was a traditional Integrated Conservation and Development Project (ICDP) aiming to ensure sustainable use of Bakoun Classified Forest whilst conserving its biodiversity, including chimpanzees. It drew on previous experience implementing co-management around Nialama Classified Forest elsewhere in the Fouta Djallon.

The feasibility study team visited villages around Bakoun Classified Forest that were involved with the programme and spoke to both former employees and villagers who has interacted with the project as well as reviewing project documentation, notably the management plan for Bakoun (Bah *et al.* 2005), baseline survey reports (Coumbassa & Gauthier 2005) and project activity reports and reviews (Catterson *et al.* 2001) as well as related literature from the Nialama component (Fischer & Furth 2000).

As seemingly the only (or at least by far the largest and longest lasting) major donor-funded development project in the area, people interviewed around Bakoun could clearly recall and describe the PEGRN project. Project infrastructure remains in Kouratongo village, though it has been adopted by local authorities, and some key project personnel have remained in the area and continue to implement their own small-scale agricultural development activities.

[20] Also known as the Expanded Natural Resource Management Activity (ENRMA) in some USAID documentation.

The project supported physical demarcation of Bakoun Classified Forest, baseline surveys, infrastructure (for example bridges on the access road to Kouratongo and a school in Laffa-Boubé), management plan development, enforcement of restrictions on hunting, agriculture and fire and local development activities, including support to beekeeping, market gardening, erosion control and agro-forestry.

In addition to several challenges with operational management, data collection and integrating conservation and development expertise, the project appears to have faced issues similar to many ICDPs of its era (Catterson *et al.* 2001), including:

- Challenges delivering development benefits;
- Unclear links between development activities and conservation outcomes;
- Risks of perverse outcomes (i.e. inadvertently resulting in an increase in undesired behaviours);
- Challenges creating appropriate and functional institutional structures for forest co-management;
- Poor monitoring of outcomes.

Our discussions with project employees and beneficiaries bore out many of these findings:

- Some of the development components seemed to have been well-received and continued to be implemented, for example, the introduction of "Kenyan-style" beehives was seen as a success and these hives were observed still in use in several villages. However, others were less successful: several villages also cited the experience of market gardening, especially of onions – the new techniques introduced worked well, but the difficulty of getting products to market meant that they were soon abandoned as un-economic. Former employees who conducted chimpanzee surveys were able to explain what they did, but were not able to explain why or how their activities contributed to conservation: it was simply a job they did.
- While some villages felt that there was a short-term increase in wildlife density during the project, they also reported that this was soon reversed when the project ended.
- The various institutional structures established, including Forest Management Committees and village development committees (responsible for developing Village Land-use Plans) had fallen completely into abeyance, and no one present was able to describe how they had once functioned.
- The approach to addressing land claims within the classified forest (especially for agriculture) was the source of significant tensions (see Section 5.6.4).

The PEGRN experience therefore illustrates the challenges of implementing conservation in this landscape, but also provides a useful and locally-specific source of lessons learned – especially via the excellent "programmatic environmental assessment" of this project (Catterson *et al.* 2001) – that can help ensure that future conservation planning does not make the same mistakes. Notably that assessment concluded that supporting conservation and sustainable use via co-management (including some strict protection) was feasible, even if it was likely to be extremely challenging.

Specific recommendations from the performance improvement review that should be borne in mind in planning for conservation in Moyen Bafing include:

- Fire is an integral part of the ecology of the landscape and should be accepted and managed.[21]
- Taxation of subsistence use is unlikely to be an equitable, sufficient or sustainable means of funding co-management.
- A template approach to forest management is unlikely to work – actions should be tailored to local circumstances that will vary significantly across such a large landscape.
- Trying to address all aspects of forest management (fire, hunting, timber, grazing, NTFPs etc) at once is likely to over-complicate implementation and create blockages and transaction costs. Rather, improvements to forest management should be *"carried out in carefully phased steps involving incremental understanding and achievement by all concerned"*.
- Community-based institutions for co-management should be very simple to reduce transaction costs, and will require significant training and support to become effectively operational.
- Recurrent costs of co-management should be kept to a minimum.

5.6.4 Attitudes towards classified forests vary

Many of the villages in Moyen Bafing were established well before the classified forests were created. Several of the villages visited for this study were several hundred years old, a fact confirmed by WCF's demographic dataset.

Despite the fact that villages we visited were present at the time of creation of the classified forest, knowledge about and attitudes towards the classified forests varied significantly. Attitudes expressed to us ranged from seeming incomprehension, to indifference and, in one case, to outright hostility. For example:

- In Laffa-Boube, villagers were familiar with the presence of Bakoun Classified forest and could describe its limits. They had continued to cultivate in demarcated zones within the classified forest during the PEGRN project and stated that it was their land, they would continue to cultivate there.
- In Niandoya, villagers, including the *Chef de Secteur*, were seemingly not aware of the existence of the Boula Classified Forest, whose northern limits were less than 2km away.
- In Dounkita, a village in very close proximity to Bakoun Classified Forest and which had seemingly been a focus of the PEGRN project, attitudes were quite hostile. The hostility was based on restrictions over access to fertile agricultural land that were experienced at the time of creation of the classified forest, and enforced during the time of the PEGRN project, rather than about hunting or other natural resource use. People we met said that there had been an increase in wildlife abundance during the time of the project (due to restrictions on hunting), but that it declined again when the project ended.

[21] *"The Sudano-Guinean-Congolian forest types of the Fouta Djallon are, with the exception of the forests occurring in the deep galleries, types that have evolved over the ages with fire as a constant of their ecological conditions. Fire, quite simply, cannot be avoided. And if it were, there would be a good chance that the resulting build-up in biomass would burn during a drier year—and have a much more severe impact on the ecosystem."* Catterson *et al.* (2001, p42).

- The population of Kondékerin was largely unaware and unconcerned with the existence of the nearby classified forests – Bani and Dokoro – which are outside of their traditional village territory. While residents are aware of the rules pertaining to management and extractive uses of forests and wildlife, they were not clear about differences in rules between a classified forest and 'zone banale' (unclassified area).
- In Bani Ndantari, in the enclave inside Bani Classified Forest, the elders and much of the younger male population were aware of the existence of the protected area, and were able to describe the boundary. They said that agriculture is forbidden there, but did not indicate that other restrictions apply because of its protected status. Burning, grazing, (traces of) hunting, tree cutting and collection of NTFPs were observed in the classified forest, and informants generally seemed to consider that only the standard rules applicable everywhere apply to these latter activities in the classified forest. No one cited resentment in relation to the classified forest. Women were unaware of the existence of Bani Classified Forest and expressed no opinion about it.

This range of attitudes suggests that 1) the existing status of the classified forests is not necessarily widely understood or accepted and 2) at least some villages consider that the gazettement of the classified forests did not abrogate their claims to land and resources within them. Given this, simply trying to enforce the existing legal restrictions on land use may lead to conflicts that do not necessarily further conservation goals. The issue of land claims in protected areas is discussed further in Section 6.

5.7 Major social factors influencing the establishment and management of a protected area in Moyen Bafing

Table 9 below presents the main socio-economic considerations that could influence the establishment and management of a protected area for the Moyen Bafing as well as identifying potential means to address them. Some factors are favourable to conservation if built on successfully, whilst others will be challenging to address. None are considered fatal flaws to implementing conservation, assuming they are appropriately taken account of from an early stage.

Table 9: Overview of major socio-economic considerations influencing establishment and management of a protected area for chimpanzee conservation in Moyen Bafing. Some will be challenging to address, but none are considered fatal flaws for implementing effective chimpanzee conservation

Factor	Implications for feasibility of conservation	Opportunities / Approaches to ensure feasibility	Summary implication for feasibility
Strong traditional authority structures. Council of elders is a flexible but deeply ingrained structure in local villages and towns, the highest decision-making body in a village. Principal purposes are to maintain the traditions and values of a community and manage conflicts between people and families. Its authority extends to local land tenure, land use and use of natural resources. It metes out justice when necessary. Works closely with imams, combining traditional and religious authority. Deeply respected.	Positive: The existence of strong and legitimate local institutions has been associated with increased probability of conservation successes (e.g., Dougill *et al.* 2012). Conversely, trying to create parallel structures can create confusion and reduce the sustainability of conservation outcomes.	Rather than build parallel structures, work with councils of elders (incl. imams) to manage access to land, communal resources, sustainable livelihoods, and role of women in manners compatible with a MBPA. Working with District Chiefs and Mayors, engage councils of elders according to existing governmental hierarchy to aggregate decisions and management approaches.	Generally positive
Access to land. Villages make strong traditional claims to land, including within the existing classified forests. Fertile agricultural land is a critical resource, and in some villages is a source of conflict with the classified forests.	Conservation actions that cause villages to lose access to land, or create the perception that they may, are likely to be a source of significant conflict. Conversely, the existence of clear land-tenure arrangements and local control over decision-making about land has been associated with conservation success (Ostrom 1999; Dougill *et al.* 2012), and since access to land is controlled by	Ensuring that the conservation zoning and gazettement process clarifies rather than confuses land-rights, especially by securing traditional rights to fertile land that are not well-recognized under Guinean law, may be opportunity for a win-win agreement with local communities. Working with lineage heads, elders and imams to understand and control access to land may be an	Hard, but feasible.

Factor	Implications for feasibility of conservation	Opportunities / Approaches to ensure feasibility	Summary implication for feasibility
Power to grant use-rights is vested in either the head of a lineage or in the council of elders, incl. imams, for communally administered lands.	relatively few people, there is a clear entry point for discussions. Ensuring that the effects of conservation actions on claims to land and natural resources (including customary rights) are identified and resolved is essential but will be challenging, especially according to the requirements of PS5,	opportunity to counteract potential negative impacts of influx in the face of industrial projects. Improve agricultural practice outside the ZIP in order for adjoining villages to feel a benefit for protecting the forest	
Communal resources (e.g. water, wood products, game, fish, NTFPs) *are de facto open access* to community members, but could be regulated by the *Chef de secteur* or council of elders. However, villages have little capacity to exclude outsiders. Although villagers do not perceive most current uses as unsustainable, overhunting and rarity of game are widely understood good starting points.	The village (and in some cases village-mere/village grouping) scale is likely to be the most appropriate unit to develop improved management of natural resources. The existence of a potential institutional system for managing natural resource use at a village-level use is a significant opportunity and may avoid the need to create new institutions. Villages will require significant support to manage incursions by outsiders. The large number of villages means there will be significant transaction costs.	Conduct awareness campaigns for all targeted communities on sustainable use of natural resources. Work with elders and DNEF to actively protect communal resources from outside appropriation and unsustainable use.	Hard, but feasible
Large population, spread mostly over numerous small villages	Can result in very large transaction costs and logistical challenges.	A very tight focus on chimpanzee conservation ("not trying to do everything") can help limit the number of required activities per village.	Hard, but feasible

Factor	Implications for feasibility of conservation	Opportunities / Approaches to ensure feasibility	Summary implication for feasibility
	Will require a large team, which can create issues of quality control and inconsistencies in messaging.	Prioritizing villages to be engaged will be necessary (e.g., a phased approach). Involving a conservation partner with experience of implementing projects at a landscape scale will be essential.	
Heterogenity between villages in type and intensity of land-use, access to markets, degree of social cohesion and other economic activities.	A template "one-size-fits-all" approach is unlikely to be appropriate. Rather, interventions should be adapted to local contexts. It will take time to understand the variability and tailor interventions to suit.	Clearly recognize the issue of heterogeneity in conservation planning (e.g. in the *Fiche de projet*). Identify / map the main dimensions of heterogeneity early on in conservation planning and work with a sample of villages in different situations. Clearly document assumptions underpinning identified intervention strategies and monitor to verify their veracity.	Hard, but feasible
Rural exodus. Economically active men emigrate in search of better opportunities, and people who can send their children to be educated in towns and cities. This reduces available labour in villages and use of land and natural resources in rural areas, but means	Given that young men are already seeking to migrate, helping them identify appropriate opportunities away from the village (e.g., through improved access to education and training) may be a way of reducing local pressure on natural resources. Conversely, there is a risk that effective village-based development projects could have a perverse effect of	Objective should be to help villagers to choose between opportunities elsewhere or sustainable livelihoods in the Moyen Bafing. Offer development support according to strict sustainability criteria only.	Hard, but feasible.

Factor	Implications for feasibility of conservation	Opportunities / Approaches to ensure feasibility	Summary implication for feasibility
there is a large floating population who could return.	attracting a floating population back and potentially increasing pressure on natural resources. Young people, especially young men, may be a challenge and a risk for the offset project. Their attitudes and expectations should be well understood and factored in.	Offer scholarships to children in rural areas of the MBPA. Mining companies could offer employment preferentially to people whose livelihoods are affected by the offset. Opportunities should be offered to both young men and young women.	
Role of women. Women do not emigrate. They are poorly informed about decisions that concern them; men make decisions. They use natural resources but do not appear to go as far from villages as men do.	Specific measures will need to be developed to sure that women are equitably involved in decision-making about potential conservation interventions. It is also necessary to understand specific impacts that PA creation might have on women (and develop appropriate mitigation measures if needed).	Both for ethical reasons and to help ensure the long-term success of the MBPA it is important to involve women in decisions that concern them; this presents an opportunity as well as a challenge. Women may become a strong actor of change even in a traditional society if the process is not confrontational with men/elders. An ESIA needs to look specifically at how women would be impacted. Projects that have successfully involved women exist in the region and WCF is already in contact with them.	Hard, but feasible. It may be culturally difficult to increase the power of women in decision-making. Understanding the specific role/function that women play and the specific impacts they experience is a first step.
Complex interactions with authorities responsible for natural resource management. DNEF/OGUIPAR have essentially no operating	Effective conservation will require building trust and understanding of the role of NRM authorities before scaling up enforcement or restrictions on natural resource use.	Seek to move beyond past adversarial or mistrusting relationship by identifying appropriate	Hard, but feasible.

Factor	Implications for feasibility of conservation	Opportunities / Approaches to ensure feasibility	Summary implication for feasibility
budget, and significant difficulties in doing their jobs owing to lack of transport, operating supplies, tools & equipment, documentation and technical skills. Frequently of different ethnicity from local villagers, so communications are hard and they can be mistrusted. Frequently seen as corrupt and intrusive.	It will be necessary to build mechanisms for downward accountability to communities for DNEF/OGUIPAR staff as well as upward accountability. Significant capacity building and oversight will be required, including training on human rights and due process.	means for building downward accountability into natural resource management structures.	
Attitudes towards chimpanzees. Attitudes, at least in Peuhl communities, are very accepting of chimpanzees, which are not hunted or seen as serious pests or threats. Most did not understand how they could impact chimps negatively since people and chimps live in proximity in sparsely and densely populated areas.	Explicit acceptance is a very positive basis for building conservation actions. Lack of awareness of how unusual the co-existence of chimpanzees and people is may create challenges in convincing people of the need to implement conservation actions, especially where they have a local cost.	Promote the chimpanzee as a mascot of the region and as a special and distinguishing feature of Moyen Bafing. Explicitly focus conservation planning on building on the existing cohabitation of people and chimps. Raise awareness about the requirements of chimpanzees, and what human actions could hurt them, potentially including exchange visits to sites where there is not co-existence.	Feasible.
Remoteness from markets. This contributes to reduced pressure on natural resources, but means options for delivering development benefits may be limited.	Relatively low level of commercial exploitation of natural resources offers a window of opportunity to establish robust management systems prior to the area being opened up.	Focus attempts to deliver development benefits on products that are of relatively high value, sustainable and easily transported (e.g., honey).	Challenging.

Factor	Implications for feasibility of conservation	Opportunities / Approaches to ensure feasibility	Summary implication for feasibility
	It will be essential to be realistic about potential development benefits, and to base plans on a robust economic assessment.	Ensure that any development products targeting external markets are based on a viable business plan given the current level of access.	
Attitudes towards and knowledge about the existing classified forests are variable and in some cases hostile, while the use restrictions specified for the classified forests may not always be a priority for chimpanzee conservation.	It cannot be assumed that the existing classified forests and associated use restrictions enjoy local support. Attempts to enforce them blindly may create an adversarial situation that hampers long-term prospects for conservation.	Seek to understand local comprehension of the classified forests (especially from elders who are familiar with their gazettement) and assess their legitimacy prior to attempting to enforce use restrictions. Keep an open mind about the most effective zoning for a future protected area and ensure that any future restrictions are explicitly linked to conservation objectives;	Hard, but feasible.
Development expectations from Koukoutamba dam are extremely high in the area around it. In some cases they may be based on possibly false impressions for example about the supply of electricity locally)	Local population are likely to be supportive of the dam. There is a significant risk that a protected area may be blamed if expected development benefits do not appear.	Very clearly set out and communicate the roles and responsibilities of a proposed protected area and of the dam development authority. As far as possible, ensure joint messaging to avoid inconsistent messaging about MBPA.	Hard, but feasible

5.8 Summary of socio-economic feasibility

WCF's data and the information collected by INSUCO and TBC during this assessment confirms that while many areas of Moyen Bafing have a relatively low human population density, it remains a human-dominated landscape. However, many socio-economic features of the landscape are associated with improved probability of positive conservation outcomes, including:

- Explicit local acceptance of chimpanzee presence;
- Strong and functional traditional authority structures;
- Generally clear land tenure (notwithstanding issues noted below about land claims within classified forests) and local control over decision-making about land-use;
- Relative remoteness from markets
- Limited commercial exploitation of natural resources.

These characteristics provide an excellent basis on which to develop long-term chimpanzee conservation. However, other characteristics will be more challenging to address, including:

- The large number of people, spread across numerous small villages;
- High local development aspirations, especially associated with the planned Koukoutamba dam;
- Potential direct and indirect impacts of the planned Koukoutamba dam (including any associated resettlement and development projects)
- Local heterogeneity in the type and intensity of natural resource use;
- Lack of successful prior models for improving agricultural sustainability in the Moyen Bafing area, especially for upland farming (although successful examples in neighbouring countries exist);
- Incomplete knowledge and acceptance of existing classified forests, including land claims within them.

However, whilst addressing these issues will be challenging, there is no *a priori* reason to think that it will be impossible to address them given sufficient commitment, time, resources and an appropriate approach. Some key elements of an appropriate approach include:

- Understanding and respecting existing individual and community rights to use land and natural resources. Building from the current co-existence with chimpanzees is far more likely to be effective in the long-run than seeking to exclude people from access to resources.
- Ensuring that conservation objectives and activities, including protected area-related objectives, are tightly focused on the priorities for chimpanzee conservation rather than "trying to do everything".
- Building on experiences from previous development and conservation projects, in Moyen Bafing, in the wider Fouta Djallon, in Guinea (e.g., previous experiences of forest co-management Diakité *et al.* 2010; Sunderland-Groves *et al.* 2011) and elsewhere. This will require involvement of a partner (or partners) with experience in designing and implementing development projects.
- Implementing an evidence-based adaptive management approach – as already begun by WCF and OGUIPAR – that focuses on reaching long-term goals rather than short term gains,

in particular by allowing appropriate time to identify appropriate interventions and build a supporting consensus for their implementation rather than rushing in to any particular conservation model.

The key challenge will be identifying a model for chimpanzee conservation that meets the development aspirations of the local population (including authorities) but does not open the area to widespread, uncontrolled natural resource extraction and export, or large-scale expansion of agriculture and livestock raising. While the large scale of the landscape is a logistical and institutional challenge, it also means that a more 'experimental' and adaptive approach can be applied, with multiple conservation interventions tried and tested in an adaptive management approach.

The exact conservation interventions will need to be identified and implemented through an evidence-based adaptive management approach that takes account of local heterogeneity. The process of identifying and agreeing conservation interventions this with communities, local authorities, national authorities, must be strategically mapped and executed, without rushing into a particular solution until adequate consensus exists. While WCF and OGUIPAR have been implementing an adaptive evidence-based approach and clearly stated this in discussions held as part of this feasibility study, making this approach more explicit in the *Fiche de Projet* would provide greater assurance to companies considering investing in Moyen Bafing as an offset that the required evidence-based and progressive approach will be continued.

In addition, although WCF and OGUIPAR have stated verbally that the conservation project has no intention of implementing involuntary resettlement of communities, this is not explicit in the *Fiche de Projet*. Clearly stating the intervention principles, as well as the proposed process for ensuring the principles are followed, within the *Fiche de Projet* would provide assurance that the conservation project and protected area creation will be implemented in alignment with PS5 and good conservation practice, this is addressed further in the next section.

6 Institutional and legal feasibility

Summary of key findings:

Guinean legislation is ambiguous about treatment of customary land tenure in general, and about land-tenure in protected areas in particular.

National park status in Guinea is flexible and has the advantage of clarity about industrial use within the park. However, there is significant ambiguity in the legal texts dealing with zoning and allowed activities within a national park.

Integrating clear principles and an implementation strategy for land-tenure and allowed uses into an updated Fiche de Projet would provide assurance that the protected area creation process will seek to align with best practice, including PS5.

If national park status is retained as the preferred option, the planned Arrêté temporaire de classement provides an opportunity to avoid potential ambiguities. Explictly recognising land-tenure and use-rights in the arrêté will avoid the risk of creating unnecessary conflicts

with local communities and reputational risks for companies investing in an offset and provide assurance that the potential to align with PS5 requirements will not be prejudiced.

If a protected area status that cannot be gazetted temporarily is chosen, then the final gazettement decree will have to address issues of land-tenure and land-use.

The revised Fiche de Projet and Arrêté temporaire de classement should be reviewed by individuals familiar with the Guinean legal system and with PS5 prior to validation.

6.1 Background and basis for assessment

The key requirements for an effective protected area-based offset are that:

- Protected area status creates clarity about which activities are and are not allowed, and about who is responsible for deciding and enforcing them;
- Protected area status is aligned with the identified conservation objectives and provides a clear basis for preventing or managing identified threats;
- The suite of allowed activities within the protected area is aligned with existing use rights and does not create unresolvable conflicts with local people that could in turn prejudice conservation objectives or create reputational risks for companies that invest in the offset.

In addition, as an IFC aligned offset, the legal process of protected area creation would need to align with IFC's Performance Standard 5 (PS5) on 'Land Acquisition and Involuntary Resettlement'. WCF and OGUIPAR are explicit that current plans do not involve physical relocation of people, however conservation could involve restrictions to land or other resources that will result in lost economic activity by those people who use and depend on such resources traditionally.

As described in section 2.3.1, the existing classified forests prohibit some uses and allow others, at least for some communities, and communities living in or close to the classified forest still claim land tenure and use rights there, notwithstanding their classified status see section 5.6). Any change to protected area status that could result in loss of access to resources would need to be assessed and mitigated, in accordance with PS5 and associated guidance notes, applying the mitigation hierarchy to avoid, minimise, mitigate or compensate for them. The absence of formal legal rights to the land and resources in question does not obviate the need to mitigate such economic losses; they are fully required under PS5. Whereas a responsibility exists to mitigate lost economic activities, when resources are being used unsustainably, as in the case of hunting, or illegally, mitigations will consider whether the activity should have been occurring in the first place, and whether by not mitigating a loss the inappropriate activity will continue. It is therefore critical to understand what the protected area creation process means for land tenure and use rights and whether the process is flexible enough to meet the requirements of PS5.

This section therefore 1) reviews the Guinean institutional and legal context for conservation, including the different types of protected areas possible under Guinean law, 2) assesses the advantages and disadvantages of each in the context of chimpanzee conservation in Moyen Bafing and 3) evaluates

means to address the challenges identified. This is not a formal legal assessment, but rather identifies potential legal challenges that may warrant a formal legal assessment.

6.2 Guinean institutional and legal context for conservation

6.2.1 Laws Governing Protected Forests and Protected Areas

In Guinean law, the two primary laws that address environmental conservation, protected areas categories, and management of wildlife, forests and renewable natural resources are L/99/013/AN **Forestry Law** of 1999 (*Code Forestier*), and L/97/038/AN **Law on the Protection of Wildlife and Regulation of Hunting** of 1997 (*Code de la Protection de la Faune Sauvage et la Réglementation de la Chasse*) or "Wildlife Law". The Environmental Law (Orders N°045/PRG/87 and N°022/PRG/89 – Law on the Protection and Development of the Environment) does not add anything new or substantive to these two regarding creation of protected areas, beyond defining what measures are necessary to control pollution, to conduct ESIA, and to avoid degradation of soils, water, forest, air and other receptors.

6.2.2 Types of Forest Ownership and Classification in Guinea

The Forestry Law defines the types of forest that can exist legally in Guinea, including those that are part of the State's gazetted forested estate (*domaine forestier classé de l'État*). It does not, however, define a *forêt classée* specifically, although Guinea has 162 *forêts classées*, covering 1,182,133 hectares or 4.8% of the national territory (National Biodiversity Strategy and Action Plan, 2001). Most *forêts classées* (FCs) were established by the French in the colonial era. By default, it appears that beyond the generic restrictions outlined in the Forestry and Environmental Laws, the decrees gazetting these FCs set out the specific objectives, restrictions and permissions related to each individual FC. These restrictions and permissions are, in theory, developed and detailed in each FC's management plan. In practice this does not seem to happen since gazettement decrees are frequently difficult to find or incomplete, and few FCs have (updated) management plans. Forestry and other concessions compatible with the objectives and management plan of a given FC are permitted.

In addition to the State's gazetted forested estate, forests can be classified as belonging to decentralised communes, districts, villages or other legally recognised group (*domaine forestier des collectivités décentralisées, districts et villages*) where local communities' traditional uses are favoured. However, use-rights can be granted to third parties if compatible with the area's objectives and management plan, and subject to appropriate permitting. Once again, the ministerial acts establishing these areas are usually difficult to locate or incomplete, and management plans do not exist or are outdated.

The remaining two types of legally recognised forest in Guinea are privately owned forests, such as areas where individuals or corporate bodies have legally recognised ownership to areas, and non-classified or gazetted forests, which are all remaining forested area not covered in the previous three categories. This fourth type of forest belongs by default to the State.

6.2.3 Types of Legally Protected Areas in Guinea

Apart from the generic category of *forêt classée*, whose gazettement decree sets out its management prescriptions, the Wildlife Law sets out specific types of protected area that exist in Guinea, namely national parks, strict nature reserves, managed nature reserves, special reserves / faunal sanctuaries, and hunting reserves (*zones d'intérêt cynégétique*). In its earlier articles, this law specifies the objectives, restrictions and permissions applying to each category of protected area. However, in its 'General Provisions', the Law allows zoning of all five types into more and less protected zones, leaving open the possibility of not only tourism and recreation but of sustainable socio-economic utilisation (*mise en valeur socioéconomique durable*), provided these are based on customary use rights and development projects. These five types of protected area are to have management plans that ensure the rational and sustainable use of their habitats and species contained therein. They are supposed to have clear internal rules, policies and procedures (*règlement intérieur*), approved by the Ministry responsible for hunting.

The Wildlife Law mentions biosphere reserves in passing as a model for zoning of protected areas in Guinea, too, although they have no formal legal status.

Apart from the *domaine forestier des collectivités décentralisées, districts et villages*, the Forestry Law establishes that FCs and the five types of protected area established by the Wildlife Law are property of the State (*domaine forestier classé de l'État*). The Wildlife Law is more flexible on the topic, allowing for local, collective ownership of some protected areas, or parts thereof. Furthermore, the Forestry Law states that national parks and nature reserves do not allow people's use rights. Because the Forestry Law was adopted in 1999, two years after the Wildlife Law, it could be argued that the Forestry Law was passed in full knowledge of the Wildlife Law, and supersedes it wherever the two are in conflict.

6.2.4 Considerations regarding land-tenure and resource-use rights in establishing a Protected Area

Because of the Forestry Law's provisions, from a land-tenure perspective, depending on the provisions of the gazettement decree, when a protected area is gazetted, any private or communal property rights that existed until that time could be extinguished. People and communities in certain protected area types may no longer own this land, enjoy any of the associated tenure rights, or even pursue traditional uses of natural resources, according to the letter of the Forestry Law, unless provision is made for such uses or the forested land is classified in the *domaine forestier des collectivités décentralisées*.

The issue of whether traditional land-tenure systems give rise to either formal tenure or use rights, recognised by the State, is ambiguous.[22] While not of direct relevance to this presentation of legal considerations, as the socio-economic chapter explains, communities consider they have certain inalienable rights. Denying then such rights would be counterproductive to conservation's aims and in breach of good practice, law related to environmental and social impact assessment (ESIA) and human rights more broadly.

6.2.5 Procedures for establishing a Protected Area

The Forestry Law establishes forest gazettement commissions (*commissions de classement des forêts*) in each prefecture, which can join when an area covers multiple prefectures. These commissions study proposals to classify forests into the State's gazetted forested estate or forests belonging to decentralised communes, districts, villages or other legally recognised groups, or proposals to revise existing classified forests. For a proposal relating to the State's forest estate, the Ministry responsible for Forests proposes the gazettement to the President, who classifies it by decree. For a proposal relating to the *domaine forestier des collectivités décentralisées, districts et villages*, the concerned Prefect(s) propose(s) it to the Minister responsible for Forests who gazettes it by ministerial order. The same procedures and responsibilities apply to changes to both types of classified forest, including their degazettement.

The Wildlife Law establishes that national parks are created and modified based on a proposal made to the President by the Ministry responsible for Hunting, accompanied by a report prepared jointly with the other concerned ministries. Strict and managed nature reserves and special reserves/faunal sanctuaries are created and modified by Presidential decree, based on a proposal made by the Ministry responsible for Hunting, after notification by the concerned ministries. Hunting reserves are created by Presidential decree based on a joint report of the Ministry responsible for hunting and other concerned ministries.

Article 79 of the Forestry Law establishes that the Ministry responsible for forests can propose specially protected areas, like national parks or nature reserves, in forested areas of exceptional interest whose integrity must be protected. These specially protected areas are established and managed in accordance with the relevant legislation and are protected according to the rules laid out in this legislation. In practice, this provision appears to be interpreted as allowing a minister to create by ministerial order a national park, strict nature reserve or managed nature reserve rapidly, pending

[22] Guinea's Public and Private Land Law (*Code Foncier et Domanial*) of 1999 does not explicitly recognise traditional land tenure systems. However, it appears to recognise traditional tenure systems implicitly in Article 39, and Guinea's Rural Land Policy (*Politique Foncière en Milieu Rural*) of 2001 commits the country to revising its land-tenure law and regulations to recognise and protect traditional land-tenure systems and rights, which has not yet happened.

the signature of a presidential decree to the same end that enshrines the protected area's status in a higher form of law.

Establishment of any of the protected area types listed above requires an ESIA, which is regulated by the Environment Law and a series of subsequent decrees and regulations. The ramifications related to land-tenure, access and use right of establishing a protected area should be explained to affected people as part of the ESIA process, and their responses and opinions should influence the final decision whether to establish a protected area and how it should be structured.

6.2.6 Management of Protected Areas

The Ministry responsible for Forests manages *forêts classées* in Guinea, while the Ministry responsible for hunting is responsible for managing the five types of protected area established under the Wildlife Law, except where they are composed of the *domaine forestier des collectivités décentralisées, districts et villages*. In this latter case, the rural entity designated by the relevant ministerial act is responsible.

In the case of *forêts classées de l'Etat*, it is the relevant prefectural Directorates of Water & Forest, and their field officers in the relevant sub-prefectures, who manage them. However in some cases, a special structure is established to manage one or more such classified forests, such as the Forestry Centre of N'Zérékoré, that manages the FCs of Ziama, Diécké and Mont Béro among others in Guinée Forestière.

The five types of protected areas established in the Wildlife Law are managed by the Guinean Office for Protected Areas and Reserves (OGUIPAR). OGUIPAR's staff can sometimes be assigned to areas without one of the five protected area types, such as to a *forêt classée de l'Etat*. OGUIPAR's staff report to a centrally located structure, based in Conakry, rather than to prefectural directors, thus giving them an ability and mandate to work across administrative boundaries like prefectures and administrative regions that Water & Forests staff do not have. However in some cases, like the Centre for the Management of the Environment of the Nimba and Simandou Mountains (CEGENS), a special structure is created to manage a specific protected area or areas with particular needs or characteristics.

Both the Forestry and Wildlife Laws explicitly permit the Ministries responsible for forests and for hunting[23], respectively, to establish contracts for the management of the protected areas they are responsible to manage. Such contracts can be with any individual or legal entity, public or private, including rural communities or associations and NGOs, provided they have adequate professional qualifications.

[23] Currently, forestry and hunting are both in the portfolio of the Ministry of Environment, Water and Forest so they are managed coherently by a single minister.

6.3 Objectives, permitted and forbidden activities, and allowable land-tenure statuses for Protected Area types

Table 10 below presents the protected area categories outlined in the Forestry and Wildlife Laws, describing their main objectives, restrictions, authorised activities and allowable land tenure statuses and Table 11 presents potential advantages and disadvantages of each of the protected area categories for a Moyen Bafing protected area.

The analyses presented in these two tables shows that there are a number of ambiguities and potential contradictions in Guinean protected area laws. A process of gazettement that does not proactively address these ambiguities has the potential to alienate local communities, create reputational risk for companies investing and potentially prejudice opportunities for aligning with PS5. These ambiguities can be resolved by proactively addressing them in project documentation. In particular, it will be important that:

1. The *Fiche de projet* is revised to explicitly set out the principles and approach to land tenure and land-use in Moyen Bafing.
2. Temporary protected area status (if national park or special faunal reserve options are chosen) clearly maintains existing use rights until a due process of negotiation and free, prior and informed consent (and where necessary PS5-aligned) about any changes is completed

To ensure these steps are legally robust as well as aligned with good conservation practice and PS5, it would be important that the *Fiche de projet* and draft *arrêté de classement temporaire* are 1) based on a full legal assessment of the best way(s) to meet the objectives of the proposed MBPA, while respecting local communities' formal and traditional uses of and rights to land and natural resources within the targeted area and 2) reviewed by specialists familiar with the requirements of PS5. This could be achieved via the offset oversight technical/oversight panel discussed in Section 7.

Table 10: Protected Area categories and associated characteristics in Guinea

Type of PA	Law (main articles) defining PA type	Main objectives of PA type	Restrictions	Human uses permitted	Land tenure status
Forêt classée d'Etat (FC)	Code Forestier (CF) (28, 33-41, 58-80, 94-97)	Provision of forest products and forest services to ends defined by the State	Fire, grazing, introduction of exotic species, abusive tree-cutting or vegetation clearance, and actions that degrade soils. Other restrictions depend on the decree gazetting the FC, the contracts granted for activities in the FC, the FC's management plan and relevant permitting requirements (as for change of land-use). Uses by traditionally forest-dependent communities are forbidden for commercial uses or uses not in accordance with FC's management plan.	Uses of forest products for domestic consumption by traditionally forest-dependent communities according to the FC's management plan. Other uses depend on the decree gazetting the FC, the contracts granted for activities in the FC, and subject to relevant permitting requirements. Change of land-use, excavation, quarrying, mining and roads are permitted only with special authorisation from the Ministry responsible for Forests.	Domaine forestier classé d'État, thus private or communal ownership forbidden
Domaine forestier des collectivités décentralisées, districts et villages (DFC)	CF (28, 43-51, 58-80, 94-97)	Provision of forest products and forest services to rural collectives, districts and villages	Fire, grazing, introduction of exotic species, abusive tree-cutting or vegetation clearance, and actions that degrade soils are forbidden. Other restrictions depend on the ministerial act gazetting the DFC, the contracts agreed for activities in the DFC, the DFC's management plan and relevant permitting requirements. Uses by traditionally forest-dependent communities are forbidden for uses not in accordance with DFC's management plan.	Uses of forest products for domestic consumption by traditionally forest-dependent communities according to DFC's management plan. Other uses depend on the ministerial act gazetting DFC, the contracts agreed for activities in the DFC, the DFC's management plan and subject to with relevant permitting requirements. Excavation, quarrying, mining and roads allowed only with special authorisation from the Ministry responsible for Forests.	Domaine forestier des collectivités décentralisées, districts et villages
National Park (NP)	Wildlife and Hunting Law (CPF) (12-17, 34-41); CF (96)	Protection of wildlife. Protection of sites, landscapes, geological formations of scientific	No capturing or hunting of wildlife or disturbance of its dens, nests, etc. No disturbance of vegetation. No driving or overnight stays outside of designated areas. No firearms. No overflights	Recreation and research. Certain activities like fishing or others in previous column can be permitted by the park's management, and via ESIA, if compatible with park's objectives.	Domaine forestier classé d'État normally excluding private or collective ownership. CPF Article 33

Type of PA	Law (main articles) defining PA type	Main objectives of PA type	Restrictions	Human uses permitted	Land tenure status
		or aesthetic value. Education and recreation if compatible with previous. Transboundary protected areas.	less than 300m. No farming, forest use (exploitation forestière), fishing or aquatic resource collection, grazing, mining, excavations or exploration, drilling, pollution, terracing or building unless for park infrastructure. No sailing (marine/aquatic parks). No traditional uses of natural resources by local people (NB: this conflicts with other articles).	When possible, a NP can be zoned into core protected zones with buffer areas where traditional use activities and development projects can be pursued if compatible with the NP's objectives (NB: this conflicts with other articles).	permits collective ownership. CF Art. 96 prohibits use rights in such areas.
Strict Nature Reserve (SNR)	CPF (18-21, 34-41); CF (96)	An area dedicated to the "free reign of natural factors without any external intervention".	No hunting or fishing. No farming, forest use, mining, excavations or exploration, terracing, building, any works that alter the landscape or vegetation, water or other pollution, introduction of exotic species, or anything else that harms fauna and flora. No trespassing, aerial overflights <300m or research without permission. No traditional uses of natural resources by local people.	Not specified in Arts. 18-21, but when possible, a SNR can be zoned into core protected zones with buffer areas where traditional use activities and development projects can be pursued if compatible with the SNR's objectives (Art.36) and preceded by ESIA. (NB: similar inconsistency for SNRs as for NPs.)	Domaine forestier classé d'État normally excluding private or collective ownership. CPF Article 33 permits collective ownership. CF Art. 96 prohibits use rights in such areas.
Managed Nature Reserve (MNR)	CPF (22-25, 34-41); CF (96)?	Conservation and management of wildlife, with strict control of human activity	The gazettement decree specifies these related to hunting, animal capture, grazing, use of soils and sub-soil, and infrastructure & buildings. Unless specified, hunting is forbidden. No pollution. It is unclear if traditional uses of natural resources by local people are permitted (see CF Art. 96).	The gazettement decree specifies these related to hunting, animal capture, grazing, use of soils and sub-soil, and infrastructure & buildings. A MNR can be zoned into core protected zones with buffer areas where traditional use activities and development projects can be pursued if compatible with the MNR's objectives and preceded by ESIA.	Domaine forestier classé d'État, and possibly collective ownership and domaine forestier non classé. CPF Article 33 permits collective ownership. CF Art. 96 prohibits use rights in such areas.

Type of PA	Law (main articles) defining PA type	Main objectives of PA type	Restrictions	Human uses permitted	Land tenure status
Special Reserve/ Faunal Sanctuary (SFR)	CPF (26-28, 34-41)	Protection of characteristic faunal or floral communities, esp. protection of particularly threatened species of fauna or plants as well as the biotopes permitting their survival	Anything that is counter to the objective of a specific Special Reserve or Faunal Sanctuary, as established in its gazettement decree. No pollution.	(By default) those activities not counter to the objective of a specific SFR, as established in its gazettement decree. When possible, a SFR can be zoned into core protected zones with buffer areas where traditional use activities and development projects can be pursued if compatible with the SFR's objectives and preceded by ESIA.	Unspecified: probably Domaine forestier classé d'État. CPF Article 33 permits collective ownership.
Hunting Reserve – HR	CPF (29-31, 34-41)	Protection of game for its economic or scientific values, and for sustainable use for tourism and recreation	As specified in the gazettement decree, which must specify how & where hunting is permitted, otherwise hunting is forbidden. No pollution.	As specified in the gazettement decree, which must specify how & where hunting is permitted, otherwise hunting is forbidden. A HR can be zoned into core protected zones with buffer areas where traditional use activities and development projects can be pursued if compatible with the HR's objectives and preceded by ESIA.	Domaine forestier non classé, probably also Domaine forestier classé d'État. CPF permits collective ownership.
Hunting area	CFP (32)	Meeting local people's needs and recreation	Hunting is forbidden in places where it threatens public safety.	Hunting according to the rules in place regulating hunting.	This category refers to all land apart from categories 3-7 so is addressed under the Code foncier et domanial.
Biosphere Reserve	Not defined in Guinean law	Integrated conservation and human economic activities	Not defined	Not defined	Not defined

Table 11: Potential advantages and disadvantages of Protected Area categories for a Moyen Bafing Protected Area

Type of PA	Advantages for proposed Bafing PA	Concerns for proposed Bafing PA
Forêt classée d'Etat	Already exist for much of the area proposed for protection, so the FCs' management could simply be improved. Mgt can be sub-contracted to any competent legally recognised body.	Effectiveness in protecting chimps is debatable, in particular in the face of significantly improve roads and increased access to markets. Administrative boundaries and deployment of staff to specific areas could weaken coordination of overall landscape management.
Domaine forestier des collectivités décentralisées, districts et villages	Local communities' control of land and natural resources would be strengthened.	This is a type of land tenure, not a form of protection, so on its own it would likely be insufficient to increase protection of desired ecological values.
National Park	Well recognized, high level of protection, managed by a central authority that works across administrative boundaries. Can be established temporarily by ministerial act. Mgt can be sub-contracted to any competent legally recognized body.	Potentially conflicting provisions in CPF about whether traditional uses are allowed or forbidden, and whether zoning for subsistence and/or commercial uses is allowable. Land tenure and resource-use options inherently conflicting between CF and CPF.
Strict Nature Reserve		
Managed Nature Reserve	Flexible management category permitting zoning of conservation and sustainable use of natural resources, if specified in gazettement decree. Flexible land tenure options: State and local community ownership allowed. Can be established temporarily by ministerial act. Mgt can be sub-contracted to any competent legally recognised body.	Conservation objectives are not first and foremost, and could be compromised in areas of highest environmental priority. Potentially conflicting provisions in CF and CPF about traditional uses for subsistence and commercial purposes.
Special Reserve/ Faunal Sanctuary	A category that targets specific species or aspects of an area's fauna or flora: appropriate for chimpanzee conservation. Flexible management category permitting zoning of conservation and sustainable use of natural resources, if specified in gazettement decree. Mgt can be sub-contracted to any competent legally recognised body.	Does not target conservation of all biodiversity in an area. Cannot be established temporarily by ministerial act.
Hunting Reserve		Does not address objective of chimp conservation.
Hunting area		Offers no form of protection.
Biosphere Reserve	Consistent with the proposed approach of zoned conservation areas and sustainable-use areas. Could tap into the international network of biosphere reserves.	Offers no form of legal protection since it is a moral status, not a legal one.

6.4 Appropriate protected area categories

The analysis presented in Table 10 and Table 11 shows that national park status (that is proposed by WCF and OGUIPAR) could be broadly aligned with the objectives of chimpanzee conservation, assuming the measures discussed above are taken in order to ensure that land tenure and use rights are appropriately maintained. National park status has the advantage of explicitly forbidding industrial activity which may provide greater assurance that there will not be future encroachment on a protected area. National park status is ambiguous about allowed use rights, so these would need to be clearly specified as discussed above.

However, the status of faunal sanctuary may be better aligned with the objectives of an area dedicated specifically to chimpanzee conservation, rather than conservation of ecosystems and their constituent biodiversity in general. National Parks emphasise biodiversity conservation holistically, whereas a faunal sanctuary is focused on specified wildlife species. In a faunal sanctuary, industrial activity is only implicitly forbidden as an activity not compatible with the conservation activities, though this could be made explicit in the gazettement decree.

The category of managed nature reserve on its own is not optimal for achieving the intended conservation objectives, however it could be used in conjunction with other categories in zoning a landscape.

There are therefore potentially multiple feasible options for protected area status that could be aligned with the conservation objectives of Moyen Bafing and be compatible with community land-use and development objectives. An updated *Fiche de projet* based on the data currently being collected by WCF could be an opportunity to provide clearer justification about how the chosen protected area status meets conservation and development objectives.

6.5 Summary of legal feasibility

Although there are ambiguities in Guinean protected area legislation, these can be addressed by:

- Ensuring that choice of protected area type considers the area's conservation objectives, institutional responsibilities and jurisdictions, land tenure and use of natural resources by local residents, legal clarity, clarity in the objectives of zoning, and urgency of a legal act establishing it.
- The *fiche de projet* and gazettement decree (including a temporary one) should provide maximum clarity on the issues above to reconcile ambiguities and inconsistencies within and between the Wildlife and Forestry Laws.
- A thorough legal analysis should precede and inform the drafting of a gazettement decree, analysing the issues highlighted in this chapter, and any others as relevant.
- The revised *Fiche de projet* and draft gazettement decree should be reviewed by a specialist in PS5 prior to finalisation.
- If there are compelling reasons to do so, a protected area may be established on a temporary basis by ministerial act. This act should be sensitive to the issues highlighted above, in particular explicitly recognising existing customary land tenure and use-rights, and consider

itself a temporary measure, not prescribing the eventual legal form that a presidential decree would take.

If this approach is taken, residual risk is low, but if it is not, a rushed approach could create significant risks of conflict with local communities, reputational risks and difficulties aligning with PS5.

7 Governance and management

Summary of key findings:

It is challenging but feasible to establish a governance model that will meet the requirements outlined in this section; successful case studies exist elsewhere.

Selection and establishment of a governance structure for the biodiversity offset and MBPA will require consultation with stakeholders, negotiation with relevant government authorities, and advice from legal and taxation specialists.

7.1 Background and basis for assessment

Governance refers to the structures and processes that are designed to ensure accountability, transparency, responsiveness, rule of law, stability, equity and inclusiveness, empowerment, and participation (UNESCO[24]) of a project or activity.

Management refers to the actions implemented on the ground in order to meet the objectives of the conservation project (e.g. chimpanzee conservation, sustainable livelihoods for local communities, etc.)

The companies funding the implementation of offset activities and sharing the biodiversity gains generated by offset actions do not own the offset area. Conservation is also not the core area of business or expertise of the companies and therefore management of the area will require engagement with multiple actors who have different rights, mandate, authority, interests and capacity.

This section maps out some potential governance options. Legal opinion on their feasibility and appropriateness to the Guinean context has not yet been sought; obtaining this is a key next step.

7.2 Types of activity that will be required to manage the MBNP

The broad potential types of activity that will be required within the MBNP are divided into four key management areas; Operations, Administration, Community Engagement and Research and Monitoring (see Table 12). There are many overlaps between these potential activities which are not

[24] http://www.unesco.org/new/en/education/themes/strengthening-education-systems/quality-framework/technical-notes/concept-of-governance/

explored in this high-level overview. It is anticipated that these activities will be implemented by an 'Implementing Partner' (IP). Potential options for an IP are outlined in Section 7.6.

Table 12: Broad types of management activity

Management area	Examples of potential types of activity
Operations	• Negotiation, delimitation and maintenance of clear MBNP boundaries between the agreed use zones • Strategic patrolling and joint patrolling with communities of the MBNP to prevent and control illegal activities through the enforcement of laws • Provision of infrastructure and equipment to facilitate patrols • Comprehensive frequent training and supervision of park guards, including monitoring the effectiveness of patrols • Ensure activities are effectively communicated with all internal and external stakeholders
Administration	• Support in the development of Management Plans, Annual Operating Plans and budgets • Robust and transparent financial and staff management procedures • Effective communication and reporting with all stakeholders • Establish and maintain collaboration with the projects key local, national and international stakeholders • Attract further interest and financial support for conservation activities in the MBNP
Community Engagement	• Assess and implement effective Community Based Natural Resource Management practices, including potential co-management of areas • Reduce human-wildlife conflicts • Improve organization and capacity of small holders • Development of small scale ecotourism • Improve access of local communities to health, education and financial services and opportunities
Research and Monitoring	• Research and monitoring of key species, habitats, environmental and socio-economic factors to inform future management • Maintenance of a research database

	• Dissemination and reporting of research results

7.3 Primary in-country institutional and management stakeholders

The main governmental authority with responsibility for Protected Area management is the Ministry of Environment, Water and Forests (MEEF). Responsibilities for management of National Parks are delegated to OGUIPAR, whilst the National Directorate of Water & Forests (DNEF) holds responsibility for managing the country's classified forests, as well as for the use of forests and wildlife regardless of protection status. Approval of a future governance structure is likely to require sign-off and oversight by MEEF whilst the management and oversight of the implementation of activities in the NP is more likely to involve OGUIPAR and the DNEF.

The Wild Chimpanzee Foundation (WCF), a conservation NGO, which has on-the-ground experience in the region and significant experience in chimpanzee conservation is a further key stakeholder. WCF is known and respected by MEEF, and is playing a major role in the establishment of the MBNP and anticipates a role overseeing the management of the NP and in the implementation of certain activities once the NP is established.

7.4 Key requirements of a governance structure

To manage the risks associated with long-term investment into land not controlled by the companies, the governance structure established will need to ensure that:

1. The State clearly agrees that the area can be operated as an offset for the companies and that any conflicting land-uses or designations are precluded;

2. The roles and responsibilities of the State, the offset companies and management entity with regards to the offset area are clearly legally established;

3. The roles, responsibilities, means of working, communicating and reporting are clearly mapped out between the different levels of the governance structure;

4. Existing rights of local communities and others are protected, or compensated and an effective grievance mechanism is established to address arising issues;

5. A mechanism exists for assessing progress and resolving any discrepancies between stakeholders;

6. A robust, science-based mechanism exists for attributing biodiversity gains between the two companies, and/or other donors;

7. The structure aligns with Guinean law and international best practice for accountability and transparency; and

8. The structure provides assurance that management of the proposed protected area will be aligned with offset requirements, whilst providing sufficient flexibility to implement adaptive management in response to emerging threats and issues.

The Governance structure is likely to take the form of a series of legal agreements that bind the State, the offset companies and the MBPA's management entity in long-term arrangements to ensure conservation management of the offset area. The establishment of a new legally-recognised management entity may be required.

Although the offset area will be ultimately under the management authority of the Ministry of Environment, Water and Forests, other branches of Government may have an interest in the area, especially if the proposed Koukoutamba dam development goes ahead. To ensure that the designation of a site as an offset is not compromised by conflicting interests, it is important that the governance structure take account of these interests. The already-established Moyen Bafing Inter-ministerial Commission may prove to be a useful mechanism for communicating and ensuring buy-in from different branches of the State. However to ensure security of offset investment, the Presidential decree establishing the MBPA definitively must clearly and permanently set out the limits to such industrial developments in the protected area and legal agreements between parties may require approval within Government e.g. from Cabinet.

7.5 Levels of governance

The potential role and responsibility of each of the levels within the offset governance structure is described in Table 13.

At '**level 1**' is the IFC and its clients; through legally binding loan agreements IFC's clients will contribute an agreed amount of finance for a biodiversity offset project in Guinea. It is currently anticipated that a Trust Company (TC) or similar will be established to represent the interests of the IFC and its clients in offset activities in Guinea.

At '**level 2**' is the Trust Company (TC), which will be a single offshore entity. Its purpose will be to:

1. Enter into legally binding agreements with the IP to represent the interests of the IFC and its clients in offset conservation measures in Moyen Bafing National Park over the lifetime of the offset project

2. Hold and disburse funding to the IP. The funding will be contingent on the IP's effective implementation of agreed activities (as established though 5 year Management Plans and Annual Operating Plans and budgets) and checks and balances will need to be established to manage this process.

3. Whilst the IFC and its clients do not require an active role in the implementation of offset activities, the potential for having a representative from the TC either as a member of a company or on a board of directors of the IP should be investigated with legal counsel as it is a possible mechanism for aligning the interests of the offset donors with activities in country.

4. The TC will develop rules to apportion the offset gains derived from the MBPA between its members (and/or investors)

5. The TC will receive, review and transmit to the members (and/or investors) technical, financial and administrative reports from the IP.

6. The TC will establish a specialist offsets panel to act as the technical offset advisors to the TC. The panel will review all management documents provided to the TC by the IP in order to assess progress and make recommendations for improvement of management activities and dispersal of funding to the IP. In addition the panel will make recommendations for the division of offset gains between the members (and/or investors) of the TC. The panel will likely be composed of the IFC's clients Independent Environmental and Social Consultants (IESCs), drawing if required on external specialist consultants.

At '**level 3**' is the Implementing Partner (IP) who will be responsible for the management of the National Park for the lifetime of the offset project (and potentially beyond). The IP will be required to enter into a legally binding agreement with the TC to develop and implement management activities that are agreed to by the TC (and its offset panel). The legal nature of the IP entity is not currently known, some potential options for the entity are assessed in Section 7.6 and legal counsel will be required to provide advice on the agreed potential options. The IP will develop the park's 5-year management plans and annual operating plans and budget, undertake or contract out all management and monitoring activities (e.g. law enforcement, community outreach, scientific and social monitoring). Various advisory panels and/or steering committees (e.g. scientific, local communities) may be convened by the IP to provide support and oversight.

At '**level 4**' are the entities that will be sub-contracted by the IP to undertake the activities outlined in the Annual Operating Plan.

Table 13: Potential roles for the parties involved in a MBPA offset governance structure

Level	Potential role and responsibilities	Requirements / Notes
Level 1 – IFC and companies investing in offset	• Establish Trust Company (TC) • Provide funds to TC according to agreed payment schedule for onward transmission to Implementing Partner (IP) • Sit on Trust Company's board; ensure its fiduciary responsibilities are met	
Level 2 - Trust Company and board	• Mainly administrative role with some technical responsibilities and functions which could be delegated to the Offset Technical Panel or other technical support group: • Receive and hold funds from investors destined to support the MBNP offset • Approve and disburse agreed level of funds to an IP to support MBPA in order to generate offset gains • Evaluate technical, administrative and financial reports from the IP for alignment with agreed management actions and budget • Apportion gains between investors following the rules and MBOTP advice • Evaluate new investors joining the TC and establish any rules for their participation • Review and transmit technical, financial and administrative reports from IP to investors and the investors' independent environmental and social consultants (ISECs) • Establish the Terms of Reference for a Moyen Bafing Offsets Technical Panel (MBOTP) and monitor its progress against the terms and work plan	• Different investors may require a greater or lesser degree of involvement; flexibility should therefore be incorporated into the structure. • TC will be off-shore. • Investigate how the TC can make payments to the IP and how they could be tax free

Level	Potential role and responsibilities	Requirements / Notes
	• Instruct MBOTP to prepare reports and special studies as per the work plan • Transmit investor and MBOTP requests, comments and directions to the IP • Facilitate the resolution of disputes between investors regarding the offset • Potentially nominate a representative of the TC on an in-country board of directors of the Implementing Partner (to be decided depending on the type of IP that is established)	
Offsets Technical Panel	• Review MBNP's 5 year Management Plan, Annual Operating Plans and budget and quarterly or annual reports against offset principles and objectives and make strategic recommendations on the MBNP management as appropriate to the TC • Propose funding release criteria and/or targets to release funds from the TC to the IP • Verify IP reports against the established criteria and/or targets to make recommendations to the TC for funding release • Review and verify monitoring results from IP (species, habitats, management effectiveness, social parameters) to assess conservation gains, or proxies thereof, against the projected gain trajectory • Periodically assess the adequacy of resources needed to realise the required offset gains and make recommendations to TC • Report on any other relevant technical matter to TC	• Careful attention is needed to avoid conflicts of interest. After an initial phase, panel should adopt the approach of an auditor, not detailed technical reviewer. • Panel should have a range of expertise: social, PA management, chimpanzee conservation and more, depending on its scope.
Level 3 – Implementing Partner	• Enter into a legal agreement with TC to receive support in return for the delivery of agreed management actions to achieve conservation gains (actions and budgets to be reviewed and updated over time in negotiation with the TC)	• IP should receive tax-free contributions from the TC. • See Section 7.6.

Level	Potential role and responsibilities	Requirements / Notes
	• Potentially enter into legal agreements with Government with regards to the management of the MBNP (this will depend on the nature of the IP that is established – see Section 7.6) • Interact with TC (and other structures to whom TC delegates responsibilities) including holding regular meetings in person or via calls and sharing of information, reports, plans and budgets as agreed with the TC and review and consider recommendations from the TC of management activities • Attract other partners (technical, financial, other) to support MBPA • Develop MBPA's management plan (5 years) and annual operating plans and budgets • Lead or oversee the implementation of Management and Annual Operating Plans and budgets, including enforcing national park legislation and entering into agreements with local communities; • Convene and/or support advisory panels as required (scientific, socio-economic, community-based, other) • Contract specialists (e.g. law enforcement, M&E, community development, IEC, etc.) as required • Carry out other responsibilities as agreed between TC and MEEF • Maintain proper accounts and prepare yearly financial statements for the TC and MEEF • Contract an auditor to undertake yearly financial audits • Establish and maintain a grievance mechanism to receive, process and respond to local stakeholder concerns in a timely and transparent manor • Abide by offset principles and ensure the existing rights of local communities are protected or compensated if impacts are unavoidable	

Level	Potential role and responsibilities	Requirements / Notes
	• These provisional roles and responsibilities will need to be reviewed once the nature of the IP is established (see Section 7.6)	
Level 4 – Specialised implementing agencies	• Execute activities on the ground, in accordance to the contractual arrangements with the IP • Monitor and report on activities in accordance with the ToR with the IP • Abide by offset principles and ensure the existing rights of communities are respected or compensated for if impacts are unavoidable	These will depend on the specific set-up chosen for the IP

7.6 Institutional options analysis

Central to the institutional structure is the implementing partner (IP). Based on the key requirements of a governance structure, options for the implementing partner (IP) can be categorised across a continuum where on one end is a model that is entirely controlled by and integrated into government, to the other end which is entirely separate from government and managed by external parties (see Figure 9.

Intermediate options exist whose specifics can be structured in multiple ways to achieve an optimal configuration that maximises governmental (and local) ownership and commitment, while permitting external experts' input and retaining a degree of external control/oversight, which is necessary in the case of biodiversity offsets in order to give the investor (i.e. the company or companies seeking to offset their impacts) sufficient assurance.

Figure 9: Continuum of options for an IP

Table 14 presents five options for an IP, moving from fully (or mostly) governmentally controlled to control by external parties. Key variables for the intermediate options include:

- Authority of the IP to implement PA management activities, particularly with respect to law enforcement,
- Abilities and motivation of the IP and its board of directors (BoD) to hire and fire staff and partners (NGOs, service providers), and to sanction under-performance or misconduct,
- Leverage that the companies investing in the offset (or an institution such as a Trust Company acting on their behalf) have over the IP; specifically their ability to require change or to replace an IP completely in the case of serious under-performance or misconduct,
- Powers and membership of the IP's board of directors,
- Political leverage over IP, and extent to which the IP can be protected from political pressures and non-technically motivated actions, and
- Roles, powers and membership of any advisory panels or committees (scientific, socio-economic, community, other).

The next step towards offset implementation is to evaluate the pros and cons of these different options (including taking advice from Guinean legal counsel and tax experts) and come to an agreement with relevant stakeholders about a mutually acceptable model.

Table 14: Analysis of institutional options for Implementing Partner

Option	Description
1) OGUIPAR as implementing partner	OGUIPAR, as *organisme personnalisé* of MEEF, with limited real autonomy, signs agreement with CBG/GAC (or Trust Company acting on their behalf) to manage MBNP. Conditions in agreement (like independent BoD and advisory panels) would seek to ensure proper management of MBNP and conservation gains.
2) A 'MBNP' authority as *Etablissement Public à caractère Administratif* (EPA) or similar	Semi-autonomous governmental structure with independent control of budget & staff, and ability to contract partners. BoD provides technical, financial and administrative oversight. BoD can have scientific, community or other panels, and varying degree of external members
3) Create a Moyen Bafing Company (with potential charitable status)	Guinean company established with public and private members to manage the MBNP. Legal right to manage the Park transferred by MEEF. Autonomous with independent control of budget, staff and ability to contract specialised organisations. Members to include MEEF, WCF, and the Trust Company (or similar) acting on behalf of the company or companies investing in the offset. Board of Directors (BoD) to include representatives of the members and could also include representation from the local communities. BoD provides technical, financial and administrative oversight of Park Management. Can have operations, scientific, community or other departments to implement management activities or contract third parties to implement activities. Could have explicit goal of building capacity of OGUIPAR to hand over to at the end of the offset project (i.e. after 20 years) or when ready.
4) Similar to option 3 but creation of an NGO	As per above
5) Traditional donor-funded project or existing NGO	Grant to an INGO that is granted temporary rights to manage the MBNP, TC to select the INGO

7.7 Potential approach to define a governance structure for the offset area

In order to establish an appropriate governance structure there are various components that require further analysis, negotiation with stakeholders and potential future partners prior to finalisation. The adopted structure will need to address the requirements of all the stakeholders involved and not just the offset companies. For example, the Government as a key stakeholder will likely want to ensure that the structure enables benefits to the State whilst helping Guinea to fulfil its obligations under national laws and international conventions and will likely want to retain a degree of decision making, oversight and involvement in the implementation of activities in the National Park. Local authorities and communities will require a structure that promotes their well-being, provides benefits and ensures they have a voice to air and resolve any problems.

A potential approach to define the structure is outlined in Table 15, and the steps to define the structure are found in Section 7.9.

Table 15: Overview of the key requirements, potential approaches and legal mechanisms

Requirement	Potential approach for securing an offset governance structure	Potential legal mechanism
1. **Commitment by the State that the MBPA can be used as an offset site for the lifetime of the offset requirement** with provision for post-offset conservation management to ensure the biodiversity gains are maintained	1. Seek publication of an *arrêté temporaire* to establish the MBPA, define limits to industrial development and define the specifics that require further work (boundaries and community issues) 2. Seek IMCMB's formal recommendation to limit future industrial development to a level compatible with companies' offset requirements 3. Support drafting and signature of a definitive Presidential decree for the creation of a National Park or similar 4. Depending on the outcome of requirement 2, establish whether any agreements are required to transfer management rights to the legal entity	1. Rapid, temporary creation of national parks and nature reserves is possible by ministerial decree. Definitive establishment of all types of protected area in Guinea is secured by Presidential decree. 2. The IMCMB is an advisory body without legal powers, but it has moral authority over what happens in the future protected area; the President, Prime Minister and their cabinet listen to it. 3. Advice form legal counsel will need to be sought to understand what agreements are required and the approval process
2. **Establishment of a legal entity ('implementing partner') to oversee the management of the Protected Area**. The entity may need to 1. Enter into legally binding agreements with the State and the offset companies (likely to be represented by a trust company) to establish roles and responsibilities of management of the protected area, provision of funding support and reporting requirements with appropriate checks and balances in place to satisfy all	1. Consider how much control and/or representation the offset companies (and IFC) need over the MBPA's management entity. The more it is linked to MEEF, the more it will likely be supported by the State but the more it could be caught in political pressures, poor working culture and capacity limitations. The more independent it is, the more it will be shielded from political pressures and other limitations of MEEF, and the more power the legal entity and offset companies (likely to be represented by a trust company) may have; finding the right balance will be key to ensure government capacity is built and there is a sustainable long term management mechanism in place.	1. Guinea's Wildlife and Forestry Laws permit the contracting of management authority for all or parts of a protected area to any entity with adequate, appropriate professional qualifications, including private for-profit and not-for-profit companies, charitable foundations, NGOs, and individuals.

parties. 2. Contract implementing partners on-the-ground to undertake the management activities outlined in Management Plans receive support and manage the area 3. Work with stakeholders in the area, and mobilize specialized partners, to address the environmental, economic and cultural issues relevant to the MBPA meeting its objectives. 4. Have flexibility to change implementing partners, staff members and management approaches if the need arises, 5. Include a transparent and accountable mechanism to receive and distribute funds from the offset companies (likely to be represented by a trust company) with appropriate checks and balances in place	2. Based on an appropriate balance between links to and independence from the State, design with in-country stakeholders (OGUIPAR, MEEF's ministerial cabinet, WCF) a structure with clear legal personality and powers that will sign agreement with the offset companies, receive and disperse funds, lead or support the management of the MBPA, establish agreements with specialized partners to conduct on-the-ground activities, organize technical and advisory panels (like scientific committee, social development committee, community advisory committee), lobby and seek additional support for the MBPA. 3. If relevant, develop a plan to transition from a structure more controlled by private parties, to ensure an initial focus on technically robust systems and competencies in the management entity, with a transition plan to hand over responsibilities to a more governmentally controlled structure when certain milestones are met. 4. Draft documentation for the establishment of the chosen legal entity and validate in-country. Constitute entity, recalling that the temporary establishment of the MBPA should allow time to set up all the entity's structures, and that it will need to start small and realistically.	

7.8 Case study examples

The governance mechanisms of three conservation projects in Protected Areas were assessed to provide insights into the potential governance models available (see Table 16, and Appendix 5 for more detail on the case studies). Two of the case study projects are quite similar to each other and involved the establishment of a company in-country to act as the 'implementing partner' and primary entity in agreements with Government and in management oversight. In both these examples the Government delegated management authority for the Protected Area to the company. The governance structure of the third project, in Central America, was for a mining project to pay into a pre-established Government-managed fund for Protected Area management, and for the relevant authority and private partners to implement activities. It should be noted that this mechanism has subsequently broken down and the company is now directly paying for Protected Area management activities partly because the government was unable to develop or implement the required management plans.

In Guinea there is a provision enabling the transfer of management authority of a Protected Area to third parties and therefore variations of the establishment of a company or NGO (option 1 or 2) are likely to be viable for consideration, if in-country stakeholders and offset companies are in agreement with this approach.

Table 16: Pros and cons of case study governance structures

Case study summary	Pros	Cons
1. West Africa REDD (Reducing Emissions from Deforestation and Forest Degradation) project • Company established with public and private members (Government and national and international NGOs) and a board of directors which included local community representation. • Joint venture agreement between the State and the company to agree roles and transfer management rights of the National Park to the company to oversee and implement Protected Area management activities for the lifetime of the carbon project • Technical support provided to the company by the international NGO via the terms set out in a service agreement	• Clearly established legally binding structure between all parties (all agreements approved by State legal counsel and signed off by Cabinet) • Long term sustainable structure; Government and national NGO capacity being built to oversee conservation management activities post-carbon project	• Time taken to establish and gain government approval for documents (2+ years) • Currently requires strong engagement by international NGO to maintain the structure
2. Zambia conservation project. • Company established consisting of an international NGO and a community representative. All management rights of the protected area are transferred to the company • A partnership board including the company members and the government oversee some protected area activities	• Structure avoids political pressures, capacity limitations and financial mismanagement as the company has oversight control of the management activities	• Government does not have a lead role in the management of the conservation area, this is delegated to the company (this might not be acceptable in the Guinean context) • Unlikely to be sustainable in the long term as in-country capacity may not be increased sufficiently to continue with implementation

• Donor funding is provided to the company for disbursement for conservation activities		
3. Central America biodiversity offset project • Agreement for the offset company to pay into a pre-established fund for protected area management established and managed by the government • Relevant government authority to develop management plans, annual operating plans and budgets and oversee and/or implement the required conservation actions	• Company (theoretically) should only have to review progress reports from government and disburse agreed offset monies	• Highly dependent on the government's capacity and desire to develop and undertake required offset activities

7.9 Summary of governance and management

In conclusion:

- It is challenging but feasible to establish a governance model that will meet the requirements outlined in Section 7.4; successful case studies exist elsewhere.
- Selection and establishment of a governance structure for the biodiversity offset and MBPA will require consultation with stakeholders, negotiation with relevant government authorities, and advice from legal and taxation specialists.

To select and establish a preferred governance model, the following next steps are required;

1. **CBG, GAC and IFC agree the level of engagement required by the members of the trust company (TC) in MBPA management,** including the level of oversight versus delegation of authority that the TC will want in the offset

2. **Hold a debrief (*restitution*) of the feasibility study** where the companies present the study to the Ministry of Environment, Water and Forests and their preferred way forward

3. **Focused assessment of the options for a legal entity in country to lead management of the MBPA**. At a minimum the entity must:

- Be a governmental agency with significant autonomy or be able to enter into an agreement with Government to oversee the management of the offset site
- Either enter into agreements with third parties to develop and implement management plans, or establish an internal department that can do the same
- If the entity chosen is a company, the ability of the company to adopt a charitable status as it will be operating as a not for profit entity to conserve the country's biodiversity and ecosystem services, to minimise taxes and other overheads
- Have mechanisms in place to receive and distribute funds with appropriate checks, balances and be accountable to third party review

4. **Form a technical task force on behalf of the companies and IFC to assess options for the in-country entity to sign an agreement with the trust company**.

5. **Finalise options for in-country entity with Ministry of Environment, Water and Forests and WCF**, mandated to establish the MBPA, and present findings to IMCMB.

6. **Establish provisional roles and responsibilities and terms of reference (*règlements intérieurs*)** for the entities of the in-country governance structure and the reporting mechanisms between them.

8 Financial feasibility

Summary of key findings:

The in-the-field costs of establishing and managing a c.7,000km^2 protected area with multiple zones over 20 years are estimated at between USD35m and USD64m, based on current unit costs in Guinea, an illustrative set of conservation actions and assuming a hybrid model of implementation by an NGO-GoG partnership supported by specialist expertise as required. These cost estimates do not include the establishment and running costs of a trust company or similar vehicle for managing funds.

These cost estimates are not out of proportion to the scale of the investment being made and planned by CBG and GAC respectively. Neither are they out of line with the costs of offsets for residual impacts of similar significance elsewhere.

These cost estimates cover protected area set-up and 20 years of implementation, which is the forecast duration for delivering a net gain.

If only a single company were to invest (and other sources of funds were not available), it would be prudent to consider developing the MBPA in a phased approach so that the majority of resources are concentrated in a portion of the landscape until full funding becomes available, either from other mining companies or development projects seeking a biodiversity offset, or from conservation donors.

Overall, it is considered financially feasible to implement an offset in the MBPA.

8.1 Background and basis for assessment

Biodiversity conservation requires significant financing. Cost estimates are available from other conservation projects in Guinea and West Africa and have been used as a basis for preliminary estimates for Moyen Bafing. Estimates are based on an assumption that there will be a hybrid model of implementation by an NGO-GoG partnership supported by specialist expertise as required.

Estimates are based on a 20-year offset project (the forecast duration for a net gain) and include:

1. An initial set up period of 18 months
2. A two year period of establishment
3. A recurrent annual running cost

A summary budget of average costs is presented in Table 17 and Table 18. A more detailed breakdown of costs can be found in Appendix 6, including low and high range estimates. Costs do not consider inflation or the cost of establishing and running a trust company or similar vehicle for managing funds.

Table 17: Total cost of MBPA, including set-up and 20 years of operations

Phase	Low (USD)	High (USD)	Mid (USD)
Set-up (18 months)	1,300,000	2,300,000	1,800,000
Establishment (2 years)	3,400,000	5,500,000	4,400,000
Running (20 years)	30,000,000	56,000,000	43,200,000
Grand total	34,700,000	63,800,000	49,400,000

Table 18: Summary cost of MBPA broken down by major component and phase (set-up, establishment, recurrent cost once at scale)

Phase	Component	Low (USD)	High (USD)	Average (USD)	Total (USD°
Set-up - 18 months	Launch PA creation and offset process	80,000	130,000	110,000	
	Protected area technical design	1,000,000	1,600,000	1,300,000	
	Early conservation and community engagement/sustainable development actions	150,000	410,000	280,000	
	Offset design and functioning	100,000	180,000	140,000	1,800,000
Establishment - 2 years	Equipment and infrastructure	880,000	1,410,000	1,150,000	
	Finalise consultations	1,200,000	1,900,000	1,550,000	
	Institutional set up and final PA creation	190,000	300,000	250,000	
	Early conservation and community engagement/sustainable development actions	1,030,000	1,660,000	1,350,000	
	Offset specific actions	80,000	180,000	130,000	4,400,000
Recurrent annual costs once at scale	Conservation and community engagement/sustainable development actions	540,000	1,100,000	820,000	2,160,000

Phase	Component	Low (USD)	High (USD)	Average (USD)	Total (USD°
	Running costs	330,000	560,000	450,000	
	Staff costs	580,000	940,000	760,000	
	Offset specific costs	90,000	170,000	130,000	

8.2 Comparison of estimate with other Protected Areas

There is no standard estimate of Protected Area (PA) management costs. Globally, published estimates of protected area expenditure vary by more than seven orders of magnitude: from $0.10/ha/year to over $1m/ha/year (Balmford *et al.* 2003) and a global review of protected area running costs suggested that actual levels of funding for protected areas in Africa were about US$240/km^2 and the required level was about US$458/km^2 (James *et al.* 1999; costs have been scaled to 2015 dollars). However, many protected areas are not effective and so published expenditure estimates are not necessarily a good guide to the investment required to reliably achieve conservation gains (Bruner *et al.* 2004). Published estimates suggest protected area funding in Africa is frequently only 35-45% of requirements (Githiru *et al.* 2015).

This means it is hard to apply estimates of running costs of other protected areas to Guinea. A KfW-supported programme for managing 6 classified forests in Guinée Forestière which was widely regarded as successful while it operated has a budget of approximately $7m for 6 classified forests (about 2,700 km^2 in total) or about $1.2m/protected area/year. This was in an extremely challenging region for conservation (high population density) and the budget was not uniquely for protected area management so actual costs per protected area were likely lower.

The cost estimates for Moyen Bafing predict a $220 to $396/km^2 per year running cost (average $308). This suggests that the offset cost estimates made above are roughly compatible with cost estimates from elsewhere.

8.3 Summary of financial feasibility

These cost estimates are not out of proportion to the scale of the investment being made and planned by CBG and GAC respectively. Neither are they out of line with the costs of offsets for residual impacts of similar significance elsewhere. It is therefore considered financially feasible to implement an offset in the MBPA. However, if only a single company were to invest (and other sources of funds were not available), it would be prudent to consider developing the MBPA in a phased approach so that the majority of resources are concentrated in a portion of the landscape until full funding becomes available, either from other mining companies or development projects seeking a biodiversity offset, or from conservation donors.

More detailed budgets to enable financial forecasting will need to be developed as part of the set-up phase of the project. Likewise, appropriate financial mechanisms will need to be developed during the set-up phase to ensure the effective, timely and transparent disbursement of funds between the TC and the IP and between the IP and any sub-contractors.

9 Suitability of Moyen Bafing as an offset site

This section assesses the broad suitability of the Moyen Bafing site as a potential offset, with reference to good international industry practice for offsets. This builds on the assessment of the feasibility of conservation gains against ecological, socio-economic, financial and political criteria reported in previous sections, and considers questions such as:

- Tangibility of conservation gains, including the expected permanence of gains and questions of uncertainty and risk
- Additionality and leakage
- Transparency and stakeholder engagement
- Monitoring and evaluation
- Opportunities for an aggregated offset.

Overall, we found that the site meets key technical requirements for a chimpanzee offset, including: ecological equivalence, expected permanence (longevity) of gains, additionality of gains, potential to lead to an increasing chimpanzee population and suitability as an aggregated offset.

9.1 Offset design principles

9.1.1 General good practice principles

The general offset design principles used in this feasibility study are based on those developed by the multi-stakeholder Business and Biodiversity Offsets Programme (BBOP 2012a), informed by other industry guidance (ICMM & IUCN 2013; CSBI & TBC 2015) and those set out in the CBG and GAC offset pre-feasibility studies (TBC 2015, 2016). These principles incorporate the general requirements for use of offsets as part of the mitigation hierarchy under PS6 which can be summarised as:

- Offsets may only be considered as a means for mitigating impacts after all appropriate avoidance, minimization and restoration measures have been considered.
- Projects operating within Critical Habitat can only implement offsets if it can be demonstrated that (i) no other viable development alternatives exist, (ii) the project does not (including the use of offsets) lead to measurable adverse impacts upon those species for which Critical Habitat was designated (iii) there is no net reduction in the population of any Critically Endangered or Endangered species (iv) a long-term and robust monitoring and evaluation programme is developed.

- Offsets should involve measurable outcomes that can be reasonably expected to result a Net Gain of biodiversity (Critical Habitat) or no net loss of biodiversity (Natural Habitat).
- Offsets should involve biodiversity gains that are of the same type as losses, or of higher conservation value (i.e. like for like or better).
- Offsets should prevent an overall loss in ecosystem function as well as specific biodiversity values so as to ensure long-term resilience of any conservation measures.
- Offsets should be designed in conjunction with experts in offset design and implementation.

In addition to these core requirements, since the project is being financed by IFC, the offset is considered part of the project and will need to meet the requirements of IFC's Performance Standard 5 on Land Acquisition and Involuntary Resettlement.

9.1.2 Chimpanzee-specific good practice principles

Given the unique status of chimpanzees, apart from the general principles for offset design (that include ecological equivalence, additionality, use of a precautionary approach, long term outcomes, stakeholder involvement, adaptive management and transparency), two further specific design considerations are appropriate:

- Accepting only offsets that are likely to result in a stable or increasing population of chimpanzees (rather than slowing declines) so that the offset demonstrably contributes to an overall improvement in chimpanzee conservation; and
- Ensuring that the offset is at a sufficiently large spatial scale that partial failure would not compromise the entire site (or considering the use of additional 'insurance' sites to mitigate against the risk of failure at offset site(s) if this condition is not met)

9.2 Evaluation of suitability of Moyen Bafing as an offset site against good practice principles

The results of the assessment against general and chimpanzee-specific good practice offset principles are presented in Table 19.

Table 19: Evaluation of suitability of Moyen Bafing against good international industry practice design principles for offsets (general principles and chimpanzee-specific principles).

No.	Principle	Description	Interpretation and application for this assessment	Suitability of MBPA as offset (can this principle be met?
1	Adherence to the mitigation hierarchy	All appropriate avoidance, minimization and on-site restoration measures will be implemented or explored and reasonably ruled out.	A fundamental principle that is particularly important given the ethical and moral considerations surrounding chimpanzees as well as their conservation status. A review of planned and possible mitigation options was conducted as part of the offset pre-feasibility studies for GAC and CBG to verify that appropriate avoidance and minimisation measures had been identified (TBC 2015, 2016). Mitigation measures for each company are identified in their respective Biodiversity Management Plans (BMPs). The offset requirements are based on a precautionary assessment of impacts and potential gains, factoring in uncertainty around the extent to which mitigation measures would be effective in reducing residual impacts.	This principle can be met, so long as each company adheres to the full suite of mitigation measures identified in their respective BMPs.
2	Equivalence	Biodiversity gains from offsets must be 'like for like or better'.	This feasibility study focuses specifically on chimpanzees. There is no prospect of 'trading-up' to a different kind of biodiversity and so offsetting must focus on chimpanzees. MBPA has same subspecies of chimpanzee as at impact sites Broadly similar mix of habitat types between impact sites and offset site, but floristic composition and similarity not known. No other CBG or GAC CH species confirmed present though the presence of the Western Black-and-white Colobus is reported.	This principle is met for chimpanzees (but potentially not for other CH species that may require an offset).

No.	Principle	Description	Interpretation and application for this assessment	Suitability of MBPA as offset (can this principle be met?
3	Limits to what can be offset	There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected.	This is interpreted in line with PS6 para 17 requirement that a project in Critical Habitat does not cause a "measurable adverse impact on the species" for which Critical Habitat was designated. In line with GN101, this is interpreted as meaning that a residual impact that could significantly and irreversibly impair the viability of the Critical Habitat qualifying feature at a landscape-level (rather than group- or individual-level might not be offsetable. It is recognised that some stakeholders may consider that even smaller impacts on chimpanzees are beyond the limits of offsetability. Some key chimpanzee stakeholders have been consulted as part of the Feasibility Study (Appendix 5); ongoing and wider stakeholder consultation and communication during the offset design and implementation phase is recommended to try to ensure that the overall offset package is generally considered a 'fair deal' for chimpanzee conservation. This is a critical aspect of ensuring widespread acceptance of the approach to offsetting.	Alignment with this principle is possible but will require careful and ongoing SH consultation through the detailed design and implementation of the offset.
4	Landscape context	Offsets should be designed to consider connectivity across the landscape, avoiding fragmentation, and maintaining flows of ecosystem services.	The MBPA as a large landscape-level conservation project offers excellent potential for designing and implementing an offset that enhances connectivity, reduces fragmentation and maintains or enhances flows of ecosystem services. Maintaining/enhancing flows of ecosystem services to benefit local communities should be a particular focus of offset design, to help ensure that conservation is aligned with human rights and sustainable development priorities.	This principle can be met (and should continue to be considered during detailed design of the offset).

No.	Principle	Description	Interpretation and application for this assessment	Suitability of MBPA as offset (can this principle be met?
5	Net gain	A biodiversity offset should be designed and implemented to achieve *in situ*, measurable conservation outcomes that can reasonably be expected to result in a Net Gain of biodiversity over a reasonable timeframe.	MBPA has a large enough chimp population (Section 4.2) that faces sufficient threats (Section 4.3 and 4.4) that could feasibly be addressed over a reasonable timeframe (e.g. c.20 years) to produce the required level of conservation gains, taking appropriate consideration of uncertainties in estimates of impacts and gains, and risks of failure of offset delivery. The population of c.4,400 chimpanzees is sufficient for at least two significant company offsets, as long as Koukoutamba dam impacts are well managed and any planned offset for residual dam impacts is outside Moyen Bafing. A 'net gain' forecast for each company has been carried out as part of the Offset Feasibility Study, and this is reported in each of the separate company reports. These indicate that it is possible to achieve a net gain under a realistic set of scenarios and assumptions, but challenges and risks remain, and sustained funding, implementation, and adaptive management will be required to give reasonable assurance of success. The proposed offset at MBPA is designed to deliver an increasing chimpanzee population (and thus improve population viability in the long-term), rather than just slowing the rate of decline.	This principle can be met based on a realistic set of scenarios and assumptions, but risks and uncertainties remain and monitoring (of impacts and gains) plus adaptive management will be required to demonstrate and assure success.
6	Additionality	Conservation gains will be clearly attributable to the Project's actions and will demonstrably be above and beyond results that would have occurred if the offset had not taken place.	There are no active conservation activities in the landscape and wider area is not currently gazetted; the existing Classified Forests are not currently actively managed. There is no indication that funding from companies would displace other conservation funding from this site.	This principle can be met.

No.	Principle	Description	Interpretation and application for this assessment	Suitability of MBPA as offset (can this principle be met?
			Although threats are currently relatively low, they are likely to increase and be significant over the next 20 years; by reducing these current and future threats the offset can result in gains that would not otherwise have occurred, i.e. gains that are 'additional'.	
7	Precautionary approach	Estimates of gains and losses will be conservative and include a margin of precaution proportional to the risks involved in offset delivery.	A range of scenarios were used to take into account the level of uncertainty in estimates of losses and gains, including use of multipliers to account for uncertainty and temporal loss. This is reported in greater detail in the pre-feasibility studies (TBC 2015, 2016) and the company-specific reports that accompany this feasibility study. Ongoing monitoring of both impacts and gains will be carried out to check that assumptions were valid.	This principle can be met; it is recommended that offset requirements are reviewed as better information about losses and gains emerges.
8	Long-term outcomes	Biodiversity offsets should use an adaptive management approach, incorporating monitoring and evaluation, to secure outcomes that last at least as long as the Project impacts. Securing long-term finance is essential to ensuring permanence of the offset.	Provision for monitoring, evaluation and adaptive management is built into the proposed monitoring and evaluation framework (Section 9.6). The implementation plan recommends that financing of mitigation is continued beyond life of mine, i.e. for at least 20 years (Section 8). Recommendations are made to engage and develop effective partnerships with stakeholders (GoG, chimpanzee conservation groups, NGO, local community) as this is key to ensuring longevity of gains).	This principle can be met so long as expected levels of finance are provided and an adaptive management approach is taken.

No.	Principle	Description	Interpretation and application for this assessment	Suitability of MBPA as offset (can this principle be met?
			The review of financial feasibility indicates that the proposed level of funding is sufficient to achieve conservation gains in the long term, assuming that the site is implemented as an aggregated offset (Section 8).	
9	Stakeholder participation	Offsets will be based upon appropriate, extensive and transparent stakeholder consultation.	Consultation of stakeholders has been undertaken as part of this feasibility study including recognised chimpanzees experts, conservation NGOs and government. Provision for a further stakeholder participation and review is included in the implementation roadmap set out in Section 10.4. Appropriate consultation with local communities will be challenging given the size of the MPBA and the number of villages, but is essential to be in line with international good practice (including IFC PS5), which will apply to this offset.	This principle can be met, but it will be challenging to ensure appropriate stakeholder consultation in offset design and implementation given the size of the MPBA and the number of villages.
10	Transparency	The design, implementation and monitored outcomes of biodiversity offsets will be transparent, and communicated in the public domain.	A monitoring and evaluation (M&E) framework is proposed that would allow tracking of offset implementation and monitoring (Section 9.6). It is recommended that there is periodic public reporting of the M&E results. A stakeholder engagement and review process is also proposed (Section 10.5). As part of offset implementation, an appropriate governance structure will need to be put in place (Section 8) This report is expected to be disclosed publicly.	This principle can be met so long as regular and public M&E is carried out, appropriate offset governance is put in place, and relevant reports and documents are disclosed in a timely way.

No.	Principle	Description	Interpretation and application for this assessment	Suitability of MBPA as offset (can this principle be met?
n/a	Chimpanzee-specific considerations	The offset should result in a stable/increasing chimpanzee population (rather than just slowing declines). Use of 'insurance sites' should be considered to mitigate risk of offset failure.	The offset model proposed envisages stabilising/increasing the chimpanzee population rather than just slowing declines; this will be verified through M&E. The use of additional 'insurance sites' was considered but not deemed necessary because the proposed offset is at a sufficiently large spatial scale that partial failure would be very unlikely to compromise the entire site.	Principle is met but stable/increasing population trend must be demonstrated by M&E

9.3 Additionality and leakage

'Additionality' refers to whether offset gains are real (i.e. are outcomes of offset investment), or whether they would have happened anyway (ICMM & IUCN 2013).

A risk of supporting a protected area as part of an offset is that offset funding displaces existing funding so reducing the effective level of biodiversity gains generated (e.g., Pilgrim & Bennun 2014). In the case of Moyen Bafing there are no active conservation programmes in the landscape and the wider area is not currently gazetted; existing Classified Forests are not currently actively managed ('paper parks'). Although the site has been proposed as a protected area, it currently has no government funding and there are no imminent plans to provide such funding. Moreover, considering the economic situation in Guinea and the levels of finance provided to existing Protected Areas it seems unlikely to expect that the MBPA would receive adequate support to ensure effective conservation management within the foreseeable future. WCF is actively seeking support for the MBPA from other donors; there is no indication that funding from companies would displace donor funding from this site (rather, if donor funds can be secured as well, it 'de-risks' the project and provides greater assurance that tangible, long-term, stakeholder-recognised biodiversity gains will be achieved).

Although threats are currently relatively low, they are likely to increase and be significant over the next 20 years; by reducing these current and future threats the offset can result in gains that would not otherwise have occurred, i.e. gains that are 'additional'.

'Leakage' refers to the phenomenon of environmentally damaging activity relocating elsewhere after being stopped locally by conservation actions. Indirect leakage means that locally averted losses displace to other administrative areas or spread around diffusely via market effects (Moilanen and Laitila 2016). Leakage of harmful activities is a well-known problem in protected area design (Ewers & Rodrigues 1998; van Oosterzee, Blignaut & Bradshaw 2012).

In the case of the MBPA, conservation action is proposed at a landscape scale, which should help to control leakage effects. Conservation actions will not consist simply of restricting human activities (e.g. access, land clearance, hunting), but will entail working with local communities to identify and implement alternative livelihoods and development programmes that meet their needs and rights while being aligned with conservation requirements. The MBPA will consist of a mix of zones (e.g. 'strict protection', 'sustainable use' and 'development' zones); the precise model has not yet been defined but the intention is to develop a co-management approach with local communities.

Leakage is a particular problem for 'averted loss' offsets (Moilanen and Laitila 2016). The proposed offset model in MBPA foresees delivering an increasing population of chimpanzees over time (rather than just slowing the rate of decline), which goes some way to addressing this concern.

Monitoring of chimpanzee populations and their habitat will also take place at a landscape scale, which will allow direct leakage to be identified if it is taking place, and corrective measures implemented.

Leakage is very difficult to avoid completely. This is a problem that all protected areas (including biodiversity offsets) have in common. Leakage is an issue that needs to be taken seriously and appropriately considered in offset design, implementation, and monitoring, but it is not a reason to say that MBPA is less suitable than any other potential offset site.

9.4 Stakeholder participation

Stakeholder participation is a core good practice principle for offsetting. Chimpanzees are iconic animals that share a close evolutionary heritage with humans. As one of the highly threatened great apes, chimpanzees are a species of great international concern. For example, the global conservation organisation WWF recognises chimpanzees as one of its priority species, meaning they are considered as 'one of the most ecologically, economically and/or culturally important species on our planet'. Any project that has the potential to threaten their populations is therefore likely to receive high stakeholder scrutiny.

Experience from elsewhere has demonstrated that a proactive approach whereby a company engages with key environmental groups and NGOs is the best means to address stakeholder concerns and minimise project risk. Two key, highly-reputable international stakeholders concerned with chimpanzees are:

- The IUCN Species Survival Commissions (SSC) Primate Specialist Group (PSG). Within the PSG, the **Section on Great Apes (SGA)** is specifically concerned with great ape conservation. The SGA provides technical advice on chimpanzee survival through a group of leading great ape scientists and conservationists.
- **The Great Apes Survival Partnership (GRASP)**, a UNEP/UNESCO initiative focused on the survival of great apes including chimpanzees. GRASP has identified the Fouta Djallon as a priority site for Western Chimpanzee populations in Guinea and will take a special interest in any development activities within or in proximity to this area.

Consultation of a number of key stakeholders has been undertaken as part of this feasibility study including recognised chimpanzee experts, conservation NGOs and government (see Appendix 5). Provision for a further stakeholder participation and review is included in the implementation roadmap set out in Section 10.4.

Appropriate consultation with local communities will be challenging given the size of the MPBA and the number of villages, but is essential to be in line with international good practice (including IFC PS5), which will apply to this offset.

9.5 Considerations for an aggregated offset

Aggregated offsets involve two or more companies investing into the same offset site(s). This type of offset may be particularly appropriate in a Guinean context, where there are multiple companies with similar impacts having to meet PS6. Kormos *et al.* (2014) also promote aggregated offsets for chimpanzees as part of a national offset strategy.

Aggregated offsets have several potential benefits. They reduce costs related to economies of scale, as costs are spread between all projects investing into offset. These offsets are likely to receive wide stakeholder support – including from government and NGOs – as they fit well into national scale conservation planning, helping a country meet its conservation goals. Furthermore, they are strategically useful as they help facilitate large-scale ecological functionality and connectivity that would otherwise not be possible through individual, *ad hoc* offsets. This also means aggregated offsets can be effective in addressing cumulative impacts.

The large size of Moyen Bafing means that implementing effective conservation throughout the landscape will be costly. The site would ideally work as an aggregated offset in which one or more companies would invest simultaneously. This would ensure that the level of funding and hence conservation activities reach a 'critical mass' of effectiveness and avoid the risk of spreading effort too thinly across a large landscape. The population of c. 4,400 chimpanzees is sufficient for at least two significant company offsets, as long as Koukoutamba dam impacts are well managed and any planned offset for residual dam impacts is outside Moyen Bafing. Although a compromise integrating the planned Koukoutamba dam in the new protected area and for seeking sites outside Moyen Bafing for potential offsets for the dam has been floated, this has yet to be confirmed as an official Government of Guinea position. WCF is working with the Government of Guinea (including at Presidential level) to seek clarity on the form of a compromise agreement. A statement of intent in the *Arrêté temporaire de classement* and eventually an MoU between the different parties would provide greater assurance that conservation and development activities will be compatible and that the contract for dam design, construction and operation will require implementation of good practice management of biodiversity and social impacts. The source of funding and the contractor for designing and building the dam are not yet known.

Aggregated offsets can be challenging to establish, as they require close collaboration between companies (to ensure a fair and equitable offset contribution). Institutional structures for aggregated offsets do not exist in Guinea and will need to be designed from scratch. However, effective models exist from elsewhere and both IFC and WCF have begun to consider potential models.

If more than one company invests in the same offset site a mechanism will be required to attribute the biodiversity gains appropriately; the simplest method is to divide the gains *pro rata* based on the amount of funding each contributor makes (see Temple *et al.* 2012 for an example). It is not recommended that different companies invest in different sub-sections of the site as this could lead to an increased risk of various negative outcomes (lack of co-ordinated management, leakage, competition between different management authorities, perceptions of 'unfairness' between different local communities, etc).

Overall, the MBPA offers very good potential as an aggregated offset. If a single company was to invest (and other sources of funds were not available), it would be prudent to consider developing Moyen Bafing in a phased approach so that the majority of resources are concentrated in a portion of the landscape until full funding becomes available.

9.6 Monitoring and evaluation

Monitoring and evaluation (M&E) is an essential part of offset implementation and transparent and independently-verified monitoring is necessary to demonstrate that key offset principles are being adhered to and that a Net Gain is being achieved.

9.6.1 Monitoring outcomes

WCF's chimpanzee survey data for Moyen Bafing provide an excellent baseline against which, in the medium- to long term, evidence of a stable/increasing chimpanzee population and an overall 'net gain' can be demonstrated. However, measuring actual changes in chimpanzee numbers to a high level of precision and over short timeframes (e.g. <5 years) will likely be challenging in the MBPA because 1) the required gain is small in proportion to the overall population and 2) even under ideal conditions the precision possible from surveys across a wide area will be relatively low. A coefficient of variation (CV) of 11% was obtained in the 2016 WCF survey; this is a very high level of precision under the circumstances (and would be difficult to improve), but nevertheless would make it challenging to reliably detect a small change in population size.

WCF is researching a more precise monitoring method based on camera trapping (Despress-Einspenner *et al.* 2017) and plans to trial this method in Moyen Bafing starting in late 2017.

Consequently, it may be necessary to also consider more focused indicators about population structure, relative abundance and general health (e.g. body condition). One approach would be to have landscape-level[25] monitoring of overall trends in population size, occupancy and distribution, in combination with more intensive monitoring at a smaller sample of locations to measure 'early warning' indicators such as population structure and health (e.g. prevalence of disease) and to test hypotheses about how well interventions are working.

Also, considering these challenges (and the costs of surveying chimpanzees across the whole of the MBPA), it is recommended that comprehensive chimpanzee surveys are carried out at most every 2-3 years once the project is established, rather than on an annual basis[26]. More frequent surveys (e.g. annual) may have some benefits during the initial phase to confirm that the chimpanzee population trend is tracking as expected and allow for adaptive management, however the right balance needs to be struck between investment in monitoring and investment in conservation action.

Given the difficulty and potential time lags in monitoring chimpanzee populations, it is essential to also monitor pressures (threats) since: 1) pressures are frequently easier to measure; 2) pressures can

[25] I.e. the whole of the MBPA.

[26] It may be necessary to modify this schedule depending on events that might be expected to affect chimpanzee populations; for example, if the Koukoutamba Dam goes ahead it may be prudent to adjust the survey schedule in order to closely monitor associated direct and indirect impacts.

change more rapidly and serve as an early warning indicator of population changes; and, 3) they are most clearly linked to conservation interventions. The pressures to be monitored and appropriate methods and frequency should be chosen based on the theory of change developed in the management plan for the site. At a minimum pressure monitoring should include the extent and condition of vegetation types most used by chimpanzees, and hunting signs.

9.6.2 Monitoring implementation

The Management Effectiveness Tracking Tool (METT) is a widely-used and simple tool for evaluating the effectiveness of protected area management (Stolton *et al.* 2007). It focuses on assessing management processes (such as definition of goals), adequacy of inputs and training, and would be appropriate for tracking the overall effectiveness of management of the MBPA. There are other similar tools that could be used, and final choice of method would be carried out in conjunction with the selected Implementing Partner.

We suggest that regular third-party reviews of offset site management take place. A reasonable frequency would be for these to take place once every two years for the first eight years of management, with the frequency potentially being reduced (to once every 3 or 4 years) thereafter.

9.6.3 Evaluation, assurance and adaptive management

Evaluation of monitoring data compared to expected trends is an essential step in implementing adaptive management. An important part of evaluation is to establish thresholds that, if crossed, trigger further review and potentially corrective action. Two types of threshold should be established:

- Early warning or 'orange' thresholds that suggest that gains may be deviating significantly from expect trends so corrective action may be necessary.
- Alert or 'red' thresholds that suggest significant deviation from expected trends to the extent that the Project's ability to deliver a Net Gain may be jeopardised and a comprehensive review and urgent and extensive corrective action may be required.

Evaluation of monitoring results will be coupled with the frequency of monitoring campaigns. Evaluation at the offset site should be funded as part of offset finance, including the flexibility to rapidly mobilise funds for review and investigation when thresholds are breached.

9.7 Summary of suitability as an offset

Overall, we found that the MBPA meets key technical requirements for a chimpanzee offset, including: ecological equivalence, expected permanence (longevity) of gains, additionality of gains, potential to lead to an increasing chimpanzee population and suitability as an aggregated offset (Table 19). Consequently we conclude that the site is suitable as a biodiversity offset in line with international good practice principles. Monitoring and evaluation will be required to demonstrate that that the offset continues to adhere to good practice principles (and align with IFC PS6) throughout the setup and implementation phase.

10 Conclusions, road map and next steps

10.1 Summary assessment of 'red flags'

A set of potential 'Red Flags' were identified in the offset pre-feasibility studies carried out for CBG and GAC (TBC 2015, 2016). The approach used in the feasibility study to assess each of these 'Red Flags' and results are presented in Table 20, and the Koukoutamba Dam is considered in more detail in Section 10.2.

Table 20: Results of assessment of potential 'red flags'

Potential red flag	Approach taken to assess potential 'red flag'	Assessment of potential 'red flag'	Summary finding
Offset may require significant resettlement which would not comply with lender's requirements	Analyse WCF demographic survey, focus group study and zonation assessment to assess potential for effective conservation of chimpanzees in consideration of the human population. Discuss the types of management and legal status for the offset that would and would not require resettlement. Check the feasibility of developing the proposed PA in compliance with lenders' standards regarding resettlement, livelihood impacts and potential impacts on ecosystem services.	The area has a significant human population (c.70,000), but since chimpanzees and people co-exist in this landscape, conservation models that do not require resettlement are feasible. The process being proposed by WCF and OGUIPAR does not include plans for re-settlement.	Since no involuntary resettlement is planned, this is not a blocker. Clearly stating in an updated *Fiche de Projet* and *Arrêté Temporaire de Classement* that the approach to implementing conservation will not require resettlement, and incorporating appropriate requirements from PS5 would provide greater assurance on this.
Potential gains are limited because the chimpanzee population is actually not threatened	Rapid assessment of deforestation/degradation rates by remote sensing to assess chimpanzee habitat loss in Moyen Bafing Cross-check the survey approach taken by WCF and carry out a rapid field visit to ground-truth the suitability of habitat for chimpanzees, the presence of threats that could be addressed, and the social feasibility of creating a new protected area	Although threats are currently relatively low (Section 4.3), they are likely to increase and be significant over the next 20 years (Section 4.4); by reducing these current and future threats the offset can result in gains that would not otherwise have occurred, i.e. gains that are 'additional' (Section 9.2).	MBPA has a large enough chimpanzee population (Section 4.2) that faces sufficient threats (Section 4.3 and 4.4) that could feasibly be addressed over a reasonable timeframe (e.g. c.20 years) to produce the required level of conservation gains, taking appropriate consideration of uncertainties in estimates of impacts and gains, and risks of failure of offset delivery.

Potential red flag	Approach taken to assess potential 'red flag'	Assessment of potential 'red flag'	Summary finding
Dams planned on the Bafing River reduce chimpanzee population below minimum population required for an offset	Consultation with OMVS and GoG to assess likelihood and consequence of dam construction Model potential direct impact of dams infrastructure and reservoir on chimpanzees (habitat loss), and use scenarios to qualitatively estimate indirect impacts Re-assess offset feasibility to assess whether construction of proposed dams is compatible with the establishment of a PA and whether there will remain a sufficiently large area that is not impacted that is worth protecting	The Koukoutamba Dam Project is likely to result in very substantial losses of chimpanzees, equivalent to the loss of an entire 'Exceptionally Important Chimpanzee Population' or more. However, so long as there is reasonably effective management of the indirect impacts of the dam project, there would still be a sufficiently large chimpanzee population in the wider Moyen Bafing landscape to allow for implementation of an aggregated offset that would meet the needs of both companies.	Overall, the presence of the Koukoutamba Dam is not considered to present an insurmountable blocker to implementation of an aggregated biodiversity offset sufficient to meet the needs of both companies. However it does present serious risks and challenges, and further assurance from GoG and OMVS is recommended prior to investment in the offset. This could take the form of explicit language in the *Arrêté temporaire de classement* and/or publication of the Government's strategy for Koukoutamba.

10.2 Implications of the Koukoutamba Dam for offset feasibility

The Koukoutamba dam project comprises an 86m high dam to be constructed upstream of the Chutes de Bafing, with an associated powerplant, construction and operating camp, two transmission lines (routes not yet clear) and upgrading the access road from Labé (150 km from Labé-Tougué-Kollé- Kéniéoula-Koukoutamba) and construction of a bridge over the Bafing River. OMVS also plans to implement local development projects, though the nature, scale and location of these are not well defined at this point. This project is considered a national development priority at the highest levels in Guinea and so is likely to go ahead, though funding and timing are not yet clear.

Our analysis corroborates WCF's estimate that the Koukoutamba Dam Project is likely to result in very substantial losses of chimpanzees, equivalent to the loss of an entire 'Exceptionally Important Chimpanzee Population' or more. Notwithstanding the very serious negative conservation impacts that Koukoutamba is expected to have, this feasibility study indicates that provided there is reasonably effective management of the indirect impacts of the dam project, there would still be a sufficiently large chimpanzee population in the wider Moyen Bafing landscape to allow for implementation of an aggregated offset that would meet the needs of both companies.

This conclusion assumes 1) that effective management of the proposed protected area is established rapidly and prior to dam construction, 2) that the Government of Guinea, OMVS and the contractor chosen to build the dam collaborate effectively with the proposed protected area and implement good practice avoidance and minimisation of direct and indirect impacts. WCF's recent discussions with the Government of Guinea have indicated a commitment to finding a compromise between conservation and development priorities in Moyen Bafing. Overall, the presence of the Koukoutamba Dam is therefore not considered to present an insurmountable obstacle to the successful implementation of an aggregated biodiversity offset sufficient to meet the needs of both companies. However, further assurance from the Government of Guinea and OMVS would be necessary prior to investment in the offset. This could take the form of explicit language in the *Arrêté temporaire de classement* that will launch the formal park creation process, and publication of the Government's strategy for Koukoutamba. WCF are actively working towards these and publication of both is expected to be imminent.

10.3 Initiatives to deliver early gains

Since future threats to chimpanzees in Moyen Bafing are far greater than current threats, the effective conservation of chimpanzees requires a long-term perspective. It will be important therefore not to rush into trying to deliver early gains if there is a risk that doing so will compromise longer term goals. For example, an early focus on enforcing restrictions on resource use (even existing legal ones such as those pertaining to the Classified Forests) could antagonise local communities whose support will be essential for conservation to succeed over

the long-term. This is not to say that enforcement is not appropriate - it will be necessary - but to be effective it must have local acceptance which will likely take time to build.

In the short term, establishing broad local support for conservation, and especially within the area potentially affected by the planned Koukoutamba dam is likely to be the highest priority action, even if it does not lead to immediate conservation gains.

If the presence of organised, commercial hunting, or capture of chimpanzees, by people who do not enjoy the support of local communities is confirmed, this could be a focus for delivering early gains. However, even in this case, it will be important to clearly establish that enforcement actions have local support before acting.

10.4 Road-map for offset implementation

The first step towards offset implementation would be for each company to make a final internal decision with regard to selection of an offset site, and to review and agree this with key stakeholders (especially lenders). A roadmap for the set-up and establishment phases is given in Table 21. As far as possible on-the-ground planning for offset establishment and early implementation of priority conservation, community engagement and sustainable development activities should continue in parallel with the government process to build on the current momentum in the field. Immediate next steps would be as follows:

1. Organise a high-level meeting with the Inter-Ministerial Commission for Moyen Bafing set up by the Government of Guinea to present the offset requirements and receive GoG assurance / non-objection that the conservation project is considered compatible with other development projects in the landscape, particularly the Koukoutamba dam (given sensitivities over the Koukoutamba dam, more than one meeting of the inter-ministerial commission may be necessary). Obtain a preliminary agreement from Government that the area could be considered as an offset for the proposed CBG and /or GAC projects, including:
    a. Part financing of the protected area by the companies;
    b. Recognition of the non-interference of the Koukoutoumba Dam in achieving the offset objectives;
    c. Recognition of the need to resolve the issue of existing mining concessions/exploration licenses overlapping the MBPA (and other potential developments such as the Labé-Mali road, forestry concessions, etc)
    d. Tacit or explicit endorsement of the proposed land use changes in the area (through the protected area creation process) by appropriate authorities (de-risking the perception that a mining company is intervening in social, economic and political issues outside of its concession).
2. Set up a Task Force to support WCF and OGUIPAR in carrying out next steps towards MBPA establishment and offset implementation. This should include the following expertise:
    a. Performance Standard 5
    b. Delivery of successful development projects / ICDPs

c. Management of landscape-scale conservation projects
d. Chimpanzee ecology, conservation and monitoring

3. Establish an offset technical/oversight panel for monitoring progress towards offset implementation. This would initially include the biodiversity and social specialists from CBG's and/or GAC's lenders but should also include individuals with long experience in protected area management in similar contexts.

Table 21: Roadmap of next steps in the set-up and establishment phases

Phase	Component	Expected outcome	Next steps
Set-up (18 months)	Launch PA creation and offset process	High level GoG agreement for protected area establishment, overarching principles defined and included in an updated *fiche de projet / arrete temporaire de classesment*	Final decision from CBG and GAC to move forward with Moyen Bafing
			"Restitution" meeting with GoG to present FS findings and company offset plans and obtain GoG endorsement
			Disclosure of Feasibility Study
			Update 'fiche de projet'
			Draft 'arrete temporaire de classement', technical/legal review by relevant parties (incl. IFC legal team)
			Signature of 'arrete temporaire' by Minister
			Form 'Task Force' (with representation from WCF, OGUIPAR, Protected Areas management expert, social expert, legal counsel),
	Institutional, financial and legal setup - governance	Effective and transparent governance model is established	Finalise Trust Company design and establish Trust Company (/Trust Companies)
			Carry out focused assessment of the options for a legal entity in country ('implementing partner') to lead management of the MBPA

Phase	Component	Expected outcome	Next steps
			Key stakeholders agree on institutional/legal model for 'Implementing parter' (e.g. "etablissement publique a character administratif" or other) and broader governance model
			Establish different elements of agreed governance model (e.g. legal agreements, creation of relevant oversight panels/steering groups, TORs)
			Initiate discussions with potential partners
			Establish PA management consortium / implementation partnership
	Protected area technical design and SEIA	Detailed technical design is complete, leading to development of a framework management plan with detailed theory of change and protected area monitoring requirements	Complementary ecological baseline data collection, spatial modelling
			Supplementary socio-economic assessments (e.g. agricultural assessment, PS5 assessment, human rights assessment, design of consultation and consent process)
			Local stakeholder engagement and consultation ('*Cadre de concertation*', participatory mapping, environmental '*sensibilisation*')
			Develop framework management plan with indicative actions (using systematic objectives-led design tool e.g. LogFrame or similar)

Phase	Component	Expected outcome	Next steps
			Write SEIA TOR
			Carry out SEIA based on framework management plan (and incorporating findings from supplementary ecological and socio-economic assessments)
			GoG engagement
			International stakeholder engagement
	Early conservation and sustainable development actions	Highest priority threats to chimpanzees addressed where appropriate to deliver early gains, and priority sustainable development activities supported to demonstrate 'early benefits' to local communities	Implement early conservation actions
			Implement early sustainable development and community engagement actions
	Offset design and functioning	Protected area project aligned with offset principles and company needs	Establish offset technical panel (as part of governance structure)
			Update chimpanzee 'Net Gain' forecast based on framework management plan, finalise aggregation mechanisms, offset monitoring plan
Establishment (2 years)	Equipment and infrastructure	Equipment and infrastructure requirements for functioning established	Equipment purchase (vehicles, motorbikes, field equipment, IT equipment, etc)
			Infrastructure creation (base camp, field camps, etc)
	Finalise consultations with local communities	Final limits defined based on consultation and consent of local communities	Detailed consultation and consultation and consent

Phase	Component	Expected outcome	Next steps
	Institutional set up and final PA creation	Legal management plan defined and approved, local management institutions functional, final legal status obtained	Local institutional set-up
			Detailed Plan d'Aménagement and Plan de Gestion, Decret presidentiel
	Early conservation and sustainable development actions	Core staff recruited and trained, highest priority threats to chimpanzees addressed where appropriate to deliver early gains, priority sustainable development activities supported to demonstrate 'early benefits' to local communities	Core recruitment and training of staff
			External consultancy support for set-up of SMART + GIS system, implementation of social actions etc
			Early conservation actions
			Early sustainable development actions
	Offset specific actions	Verification that management plan and final PA status meet PA requirements	Oversight by offset advisory panel
			Review and evaluation, update of loss gain forecast, review compared to design requirements

10.5 Stakeholder engagement plan

As part of this feasibility assessment, we discussed the potential offset with a number of conservation and local government stakeholders (see Appendix 7). Stakeholders were broadly supportive of Moyen Bafing as an offset site; specific concerns they expressed have been addressed in the different sections of this study.

Moving forward, should GAC and/or CBG decide to invest in this site as an offset, the following further stakeholder consultation would be required:

1) Verifying that Government of Guinea are supportive of the approach. The special purpose Inter-ministerial Commission for Moyen Bafing (République de Guinée 2017) set up for this provides an ideal forum for doing so. It integrates the three main ministries involved (Environment, Mines, and Energy), as well as OMVS and local community representatives. A meeting (and potentially follow-up meetings) will be necessary to present GAC and/or CBG's objectives and requirements and understand how they can be met.
2) Once agreement from the CICMB has been reached, it would be prudent to present the technical details of how the offset would effectively deliver a net gain to the planned inter-ministerial commission on offsets and/or the Ministry of Environments internal offset committee (in the event that the inter-ministerial commission is not yet functional).
3) Further engagement with international conservation stakeholders would ideally be done through an offset technical/oversight panel, as discussed in Section 7, and on an on-going basis by releasing period offset monitoring reports.
4) Detailed engagement with local stakeholders would be co-ordinated by WCF and OGUIPAR and aside from clearly specifying the requirements (PS5 etc) does not require direct involvement by GAC or CBG.

10.6 Final conclusions

An overview of the findings of this Feasibility Study is presented in Table 1 in the Executive Summary.

The Moyen Bafing landscape exhibits great potential for the protection of chimpanzees due to the presence of large numbers of chimpanzees across a large landscape, the local acceptance of their presence, and the relative compatibility of chimpanzees' and local people's use of land and natural resource under the present economic and infrastructural conditions. These conditions are characterised by relative remoteness: seasonally poor roads, poor communications, relatively little ethnic mixing, strong traditional authority structures and low economic activity relative to other areas of Guinea. These conditions have likely caused relatively low levels of natural resource extraction and maintained large areas of habitat in a condition permitting the survival of large numbers of chimpanzees.

The site also meets key technical requirements for a chimpanzee offset, including: ecological equivalence, expected longevity of gains, additionality of gains, potential to lead to an increasing chimpanzee population and suitability as an aggregated offset.

The Moyen Bafing landscape is home to a relatively large human population (c. 67,000 in c.400 villages) who depend on access to land and natural resources for livelihoods, cultural values and wellbeing. A key challenge for implementation of conservation management is to ensure that this is done in an equitable way, ensuring that the rights of local inhabitants are appropriately considered (in line with e.g. IFC PS5) and that they experience benefits in both the short and long terms from the presence of conservation. This is the stated intention of OGUIPAR and WCF, who are already working in this direction. The MBPA project as currently planned does not foresee physical displacement or resettlement of local people, although potential for economic displacement is a significant challenge and risk to the project. To align with IFC PS5, if community members experience involuntary economic displacement due to conservation, they will have to be compensated. In addition, it is good conservation practice to build support for conservation prior to significantly increasing enforcement of existing restrictions. Particularly in the Moyen-Bafing landscape, where there is currently effective co-existence and active acceptance of chimpanzees by local people, it will be crucial to build on existing successes rather than implementing any unduly heavy-handed enforcement that could alienate local communities. Models for landscape-scale conservation projects that balance conservation and development while meeting strict standards on community rights exist (for example certified landscape-level REDD projects such as Makira in Madagascar), but this is a complex challenge and to date there are no examples of implementing such a large-scale conservation project in alignment with IFC PS5 requirements. While there is no *a priori* reason to assume this is not feasible, careful development of a conservation model, focused investment and appropriate expertise will be required from an early stage to ensure it is met.

The greatest threats to chimpanzee conservation, and hence to offset feasibility, would be significant increases in hunting – in particular of chimpanzees which appear rarely targeted at present – and habitat clearance from extraction of wood (e.g. fuelwood, charcoal, timber), or agricultural expansion. Any of these would be triggered by increased access to markets, especially if accompanied by a break-down in traditional authority and tenure systems. If poorly managed, the planned Koukoutamba dam project and access road could be an early trigger for such threats. However, the Guinean Government has shown willingness to explore compromises between chimpanzee conservation and dam construction. If this willingness is effectively translated into good practice management of the dam project and associated development projects, although chimpanzee losses would still be significant, they would not compromise the overall great potential of this landscape as a chimpanzee offset for one or more companies. In a worst-case scenario where impacts of the dam project are completely un-managed, the suitability of the site as an aggregated offset for both CBG and GAC could be compromised.

We conclude that it will be challenging but feasible to implement a chimpanzee conservation project in Moyen Bafing that is aligned with best practice conservation and delivers tangible and significant conservation gains. This will be possible subject to some modifications to the originally proposed approach to protected area creation to take account the Koukoutamba dam

and to better align the process with good conservation practice and the requirements of IFC's PS5. These modifications would need to be formally validated by the conservation project proponents (ideally by integration in an updated *Fiche de Projet* and the planned *Arrêté temporaire de classement* that will officially launch the protected area creation process) to provide sufficient assurance that conservation in Moyen Bafing would 1) be compatible with proposed development activities, notably the Koukoutamba dam and 2) meet the standards required of an offset, notably with regards to integration of local communities.

The large size of Moyen Bafing means that implementing effective conservation throughout the landscape will be labour-intensive, relying on extensive consultations and local-level conservation solutions given the heterogeneity of the landscape. The site would ideally work as an aggregated offset in which one or more companies would invest simultaneously. This would ensure that the level of funding and hence conservation activities reach a 'critical mass' of effectiveness and avoid the risk of spreading effort too thinly across a large landscape. If a single company were to invest (and other sources of funds are not available), it would be prudent to consider developing Moyen Bafing in a phased approach so that the majority of resources are concentrated in a portion of the landscape until full funding becomes available, either from other mining companies or development projects seeking a biodiversity offset or from conservation donors.

The report therefore finds that there are feasible means to address the potential blockers ('red flags') identified in the pre-feasibility report, and that Moyen Bafing could provide a suitable offset for chimpanzee conservation for one or several companies seeking to compensate for residual impacts on this species. As with any conservation project, residual risks and challenges will remain, but we have no reason to expect that implementation of a biodiversity offset in Moyen Bafing will be inherently any more risky or challenging than implementing an effective conservation project of a similar type and scale elsewhere in the Republic of Guinea. These risks can be minimised by careful specification of requirements in contracting and the establishment of an effective monitoring and oversight mechanism for the offset.

11 Acknowledgements

TBC is indebted to a number of people and organisations who provided invaluable guidance and support to the Feasibility Assessment. We would like to thank the following individuals for their extensive and detailed comments on earlier drafts of this Feasibility Assessment, which helped to greatly improve the final version: Christophe Boesch and Virginie Vergnes (Wild Chimpanzee Foundation), Sally Johnson, Mi Hyun Miriam Bae and Anna Martella (IFC), Johny Rabenantoandro and Adrian Mill (CBG), Mohamed Talhaoui (GAC), George Ledec, Medou Lo, Marie-Laure Lajaunie, and Hocine Chalal (World Bank), Peter Burston and Ron Bisset (lender's advisors for CBG), Louise Johnson and José Juan Zorrilla (lender's advisors for GAC). Sally Johnson also provided significant strategic vision, insight and energy to the overall process.

The Wild Chimpanzee Foundation carried out the ecological and socio-economic baseline surveys that were a fundamental input to this report, and WCF is a significant driving force behind efforts to protect chimpanzees in the wider Moyen Bafing landscape. TBC received

support from IFC's 'Fragile and conflict-affected situations' (FCS) program to investigate potential governance models; the draft outputs of this work have been integrated into Section 7.

Finally, we would like to thank the members of the "*Inter-Ministerial Commission for Consultation on Biodiversity and Sustainable Development issues of Moyen Bafing*" for their guidance and inputs to the MBPA process: Lieutenant Colonel Mamadou Bhoye Sow and Commandant Magassouba Bakari (OGUIPAR), Lansana Conté (MEEF). Bouya Condé and Amadou Lamine Ndiaye (OMVS), Fodé Béréte (Ministry of Mines and Geology), Dr Mamadou II Diaby and Dr Mohamed Douno (Ministry of Energy and Hydraulics), and Mohamed Lamine Sy Savane (Centre for Mineral Promotion and Development).

12 References

Africa Mining Intelligence (2017) Toubal sets sights on mining permit for end-2017. *Africa Mining Intelligence*.

Bah, A., Diallo, M.S. & Gauthier, M. (2005) Plan d'aménagement: Forêt Classée de Bakoun. Programme Elargi de Gestion des Ressources Naturelles (PEGRN), Conakry, Republic of Guinea.

Blom, B., Sunderland, T. & Murdiyarso, D. (2010) Getting REDD to work locally: lessons learned from integrated conservation and development projects. *Environmental Science & Policy* 13: 164–172.

Blomley, T., Namara, A., Mcneilage, A., Franks, P., Rainer, H., Donaldson, A., Malpas, R., Olupot, W., Baker, J., Sandbrook, C., Bitariho, R. & Infield, M. (2010) Development AND gorillas? Assessing fifteen years of integrated conservation and development in south-western Uganda. IIED, London, UK.

Boone, A.A., Xue, Y., De Sales, F., Comer, R.E., Hagos, S., Mahanama, S., Schiro, K., Song, G., Wang, G., Li, S. & Mechoso, C.R. (2016) The regional impact of Land-Use Land-cover Change (LULCC) over West Africa from an ensemble of global climate models under the auspices of the WAMME2 project. *Climate Dynamics* 47: 3547–3573.

Buckland, S.T., Plumptre, A.J., Thomas, L. & Rexstad, E. a. (2010) Design and Analysis of Line Transect Surveys for Primates. *International Journal of Primatology* 31: 833–847.

Catterson, T.M., Thiam, B., Diakité, D. & Ham, R. (2001) Programmatic Environmental Assessment of Co-Management of Reserved Forests in Guinea. Washington, DC.

Coumbassa, M.S. & Gauthier, M. (2005) Rapport d'inventaire: Forêt Classée Bakoun. Programme Elargi de Gestion des Ressources Naturelles (PEGRN), Conakry, Republic of Guinea.

Diakité, D., Diallo, M.S. & Ekstrom, J. (2010) Plan d'Aménagement et Plan de Gestion de la Forêt Classée du Pic de Fon 2010- 2030. Centre Forestier N'Zérékoré, N'Zérékoré, République de Guinée.

Dougill, A.J., Stringer, L.C., Leventon, J., Riddell, M., Rueff, H., Spracklen, D.V. & Butt, E. (2012) Lessons from community-based payment for ecosystem service schemes: from forests

to rangelands. *Philosophical Transactions of the Royal Society B: Biological Sciences* 367: 3178–3190.

Evaluation METT: Aire Protégée Transfrontalière Guinée-Mali (2009).

Fairhead, J. & Leach, M. (1996) *Misreading the African Landscape: Society and Ecology in a Forest-Savanna Mosaic (African Studies)*. Cambridge University Press.

Fischer, J.E. & Furth, R. (2000) A Performance Improvement Review of the Nialama Classified Forest Co-management Program. USAID, Washington, DC.

Fleury-Brugière, M.-C. & Brugière, D. (2010) High Population Density of *Pan troglodytes verus* in the Haut Niger National Park, Republic of Guinea: Implications for Local and Regional Conservation. *International Journal of Primatology* 31: 383–392.

Granier, N., Hambuckers, A., Matsuzawa, T. & Huynen, M.-C. (2014) Density estimates and nesting-site selection in chimpanzees of the Nimba Mountains, Côte d'Ivoire, and Guinea: Ecology of Nesting in Nimba Chimpanzees. *American Journal of Primatology* 76: 999–1010.

Granier, N. & Martinez, L. (2002) Etudes de chimpanzés de l'Aire 'Bafing-Famélé': Enquête auprès des populations locales et reconnaissance préliminaires.

Granier, N. & Martinez, L. (2004) Première reconnaissance du chimpanzé *Pan troglodytes verus* dans la zone transfrontalière entre la Guinée et le Mali. *Primatologie* 6: 423–447.

Ham, R. (1998) Nationwide Chimpanzee survey and large mammal survey, Republic of Guinea. (Unpublished). European Commission.

Heermans, J. & Williams, P. (1988) Natural resource management in the Fouta Djallon watershed, Guinea: a prefeasibility study conducted for the U.S Agency for International Development. International Institute for Environment and Development (IIED), Washington D.C., USA.

Humle, T., Boesch, C., Campbell, G., Junker, J., Koops, K. & Sop, T. (2016) Pan troglodytes ssp. verus. *The IUCN Red List of Threatened Species*.

IFC (2012a) Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts. International Finance Corporation, Washington DC, USA.

IFC (2012b) Performance Standard 5: Land Acquisition and Involuntary Resettlement. International Finance Corporation, Washington DC, USA.

IFC (2012c) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. International Finance Corporation, Washington DC, USA.

IFC (2012d) Guidance Note 5: Land Acquisition and Involuntary Resettlement. International Finance Corporation, Washington DC, USA.

Kormos, R. & Boesch, C. (2003) Regional Action Plan for the Conservation of Chimpanzees in West Africa. IUCN/SSC Primate Specialist Group and Conservation International. http://www.primate-sg.org/storage/pdf/WACRAP.pdf

Kormos, R., Boesch, C., Bakarr, M.I. & Butynski, T. (2003) West African Chimpanzees: Status Survey and Conservation Action Plan. IUCN/SSC Primate Specialist Group, Gland, Switzerland and Cambridge, UK.

Kouakou, C.Y., Boesch, C. & Kuehl, H. (2009) Estimating chimpanzee population size with nest counts: validating methods in Taï National Park. *American Journal of Primatology* 71: 447–457.

Kühl, H., Maisels, F., Ancrenaz, M. & Williamson, E.A. (2008) Best practice guidelines for surveys and monitoring of great ape populations (No. 36). IUCN SSC Primate Specialist Group (PSG), Gland, Switzerland.

Laris, P. & Wardell, D.A. (2006) Good, bad or 'necessary evil'? Reinterpreting the colonial burning experiments in the savanna landscapes of West Africa. *The Geographical Journal* 172: 271–290.

Mitchard, E.T.A., Saatchi, S.S., Woodhouse, I.H., Nangendo, G., Ribeiro, N.S., Williams, M., Ryan, C.M., Lewis, S.L., Feldpausch, T.R. & Meir, P. (2009) Using satellite radar backscatter to predict above-ground woody biomass: A consistent relationship across four different African landscapes. *Geophysical Research Letters* 36.

OMVS (2011a) Schema Directeur d'Aménagement et de Gestion des Eaux du Fleuve Sénégal - Phase 3: Schema Directeur. Organisation de Mise en Valeur du Fleuve Sénégal (OMVS), Dakar, Senegal.

OMVS (2011b) Réalisation de l'étude de faisabilité et d'avant projet sommaire (APS) de l'aménagement hydraulique de Boureya. Mission 1: Etude de faisabilité et études sectorielles. Volume 4: transports & accès / base vie / prix unitaires. Organisation de Mise en Valeur du Fleuve Sénégal (OMVS), Dakar, Senegal. http://cda.portail-omvs.org/sites/cda.portail-omvs.org/files/sites/default/files/fichiers_joint/14295_boureya_etudes_sectorielles_mission_1-_volume_4-_transports_et_acces_base_vie_pu.pdf

OMVS (2011c) Réalisation de l'étude de faisabilité et d'avant projet sommaire (APS) de l'aménagement hydroique de Boureya. Mission 1: Etude de faisabilité et études sectorielles. Volume 3: Régularisation des débits et dimensionnement de la retenue. Organisation de Mise en Valeur du Fleuve Sénégal (OMVS), Dakar, Senegal. http://cda.portail-omvs.org/sites/cda.portail-omvs.org/files/sites/default/files/fichiers_joint/14294_boureya_etudes_sectorielles_mission_1-_volume_3_-_regularisation_des_debits_et_dimensionnement_de_la_retenue.pdf

OPIC (2010) Environmental and Social Policy Statement. Overseas Private Investment Corporation, Washington D.C., USA. https://www.opic.gov/sites/default/files/consolidated_esps.pdf

Ostrom, E. (1999) Self-Governance and Forest Resources (Occasional Paper No. 20). CIFOR, Bogor, Indonesia.

République de Guinée (2017) Arrêté conjoint A/2017/848/MEEF/MMG/MEH/SGG de 27 février 2017 Portant création d'une commission interministerielle de concertation sur la diversité biologique et des enjeux du développement durable du Moyen Bafing.

Sop, T., Mundry, R., Stephens, C. & Kühl, H.S. (n.d.) Report on estimated trends in abundance of *Pan troglodytes verus* (Unpublished Report).

Stolton, S., Hockings, M., Dudley, N., MacKinon, K., Whitten, T. & Leverington, F. (2007) Management Effectiveness Tracking Tool. Reporting Progress at Protected Area Sites: Second Edition. WWF and The World Bank, Washington, DC, USA.

Sunderland-Groves, J.L., Slayback, D. a., Bessike Balinga, M.P. & Sunderland, T.C.H. (2011) Impacts of co-management on western chimpanzee (*Pan troglodytes verus*) habitat and conservation in Nialama Classified Forest, Republic of Guinea: a satellite perspective. *Biodiversity and Conservation* 20: 2745–2757.

TBC (2015) CBG Chimpanzee Pre-feasibility and Offset Implementation Strategy. The Biodiversity Consultancy Ltd, Cambridge, UK.

TBC (2016) Chimpanzee Offset Pre-Feasibility Study and Strategy for the GAC Bauxite Project. The Biodiversity Consultancy Ltd, Cambridge, UK.

Temple, H.J., Anstee, S., Ekstrom, J., Pilgrim, J.D., Rabenantoandro, J. & Randriatafika, F. (2012) Forecasting the path towards a Net Positive Impact on biodiversity for Rio Tinto QMM (No. 2). IUCN and Rio Tinto, Gland, Switzerland and London, UK.

Tractebel Engineering (2012) Aménagement hydroélectrique de Koukoutamba - Rapport d'étude d'avant projet détaillé - Note de synthèse. Paris, France.

Tractebel Engineering (2015) Définition d'une stratégie de développement du potentiel hydroéléctrique de la Guinée. AFD and Ministère de l'Enegie et d'Hydraulique, Conakry, Republic of Guinea.

Tweh, C.G., Lormie, M.M., Kouakou, C.Y., Hillers, A., Kühl, H.S. & Junker, J. (2014) Conservation status of chimpanzees *Pan troglodytes verus* and other large mammals in Liberia: a nationwide survey. *Oryx* 1–9.

UICN-PAPACO (2008) Parcs et reserves de Guinée: evaluation de l'efficacité de la gestion des aires protégées (No. 9782831710853). UICN – Programme Afrique centrale et occidentale (PACO), Ouagadougou, Burkina Faso.

van Wilgen, B.W., Govender, N., Smit, I.P.J. & MacFadyen, S. (2014) The ongoing development of a pragmatic and adaptive fire management policy in a large African savanna protected area. *Journal of Environmental Management* 132: 358–368.

WCF (2011) Chimpanzee Management Plan for the Guinea Alumina Project Concession. Wild Chimpanzee Foundation.

WCF (2012) Etat de la faune et des menaces dans les aires protégées terrestres et principales zones de forte biodiversité de République de Guinée. Wild Chimpanzee Foundation, Conakry, Republic of Guinea.

WCF (2016a) Etude démographique pour la mise en place du parc national du Moyen-Bafing. Wild Chimpanzee Foundation, Leipzig, Germany.

WCF (2016b) Inventaires biologiques pour la création du parc national du Moyen-Bafing. Wild Chimpanzee Foundation, Leipzig, Germany.

WCF (2016c) Etude 'Focus groupe': entretiens de groupe pour la création du parc national du Moyen-Bafing. Wild Chimpanzee Foundation, Leipzig, Germany.

WCF & OGUIPAR (2015) Fiche de projet: Projet de création du parc national Haut-Bafing à vocation de conservation des chimpanzés et d'appui au renforcement des capacités de gestion. Wild Chimpanzee Foundation and Office Guinéen des Parcs et Réserves (OGUIPAR), Leipzig, Germany and Conakry, Republic of Guinea.

Appendix 1 INSUCO report

Appendix 2 Technical details of deforestation / degradation analysis

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Objective: estimates rates of forest loss in two sites in Guinea, Badiar (2007-2010) and Bafing (2007-10 and 2010-2017)

Methods: SAR data processing

- ALOS-1 PALSAR-1 and 2 Synthetic Aperture data in the cross polarisation (HV) orthorectified, calibrated to slope-corrected Gamma0, scaled in dB, at 25m pixel spacing. Finally these data were co-registered into stacks for each AOI in Guinea, Bafing and Badiar. Processing performed in ESA's SNAP software version 5.0.

Methods: analysis

- Analysis undertaken using programme written in Python, including:
    - A Multi-Channel Filter applied to the stacks (Quegan and Yu, 2001), using a 4x4 window as an unbiased speckle reduction method.
    - For the ALOS-2 data, histogram matching (Richards and Jia) was applied in order to account for the higher resolution of the new sensor against the ALOS-1 data. In order to verify the results of the matching, a set of pixels over stable forest (verified through an initial change-detection analysis, and optical remote sensing data available on GoogleEarth) was extracted for each year 2007-2017 and their histograms plotted. Well calibrated data would be expected to have matching histograms across these peudo-invariant pixels.
    - Biomass estimated for each time period $t_{n..j.}$ using the equation given by Mitchard *et al*. (2009). This equation was developed developed for ALOS-1 L-band SAR data in the cross polarisation (HV backscatter) across four African woody savanna sites (in Cameroon, Uganda and Mozambique). The findings suggested a widely applicable general relationship between woody biomass and backscattering coefficients in lower biomass tropical woody vegetation with prediction accuracies of +-20%. The matrix of herbaceous savanna, wooded savanna and contiguous forest in the two Guinea sites represented a similar environment, and hence an appropriate context in which to apply the equation as a means to create a first order habitat differentiation, and thereafter forest loss estimation.

- Applying the equation across the stack of processed SAR scenes per site produced a stack of per-pixel biomass estimates for the periods a) 2007-10 for Badiar; and b) both 2007-10, and 2010-17 for the Bafing site.
- These estimates were then cross-referenced with field observations of habitat types
- **Change detection:** A rule based-classification undertaken for each site to estimate forest loss. This involved the following steps:
    - dividing the biomass estimate for each site into three threshold-derived categories low-biomass values (<20 tonnes per hectare, likely to be herbaceous savanna); medium biomass values (20-40 tonnes of biomass per hectare, likely to represent rotational agriculture and lower biomass woodland-savanna); and finally the highest biomass class (at least 145 tonnes per hectare) which was likely to be forest.
    - For each site, the time series of data was then exploited in order to estimate the number of pixels which fell from the high biomass category (forest) to the lower biomass category i.e. the first criterion for forest loss was that a pixel's biomass value fell from 145 tonnes per hectare to 40 tonnes per hectare, thereby accounting for potential errors in the estimate of biomass for any given year, and any remaining errors in the cross calibration over time for the HV backscatter values. The second criterion was that after falling to this lower level of biomass, the pixel's value had to remain low. This reduces the possibilities of false-positive changes due to e.g. speckle noise (random values in the SAR signal) and any environmental changes unrelated to habitat change (large change in moisture values).
    - If a pixel met these two criteria it was classed as deforested. To reiterate, to estimate forest loss, the pixel must have been classified as forest at t0 (2007), and its biomass value then fall below the lower forest threshold in any of the subsequent time periods, and then remained as non-forest for the remainder of the time period. For the later change detection at Bafing (2010-2017) pixels defined as having lost forest must have been classified as forest in the previous time period (2007-10), and then drop out of the forest class by 2017.

Results and interpretation:

Badiar cross referencing biomass estimates against field data yielded the following statistics:

$Champ

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
33.87	83.43	114.00	108.60	149.30	150.00

$`Foret a strate arbustive`

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
32.26	91.32	150.00	126.30	150.00	150.00

$`Foret bambous`

```
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  8.242   8.267  52.670  57.240  63.290 150.000

$`Foret claire`
   Min. 1st Qu.  Median Mean 3rd Qu.    Max.
  63.75   63.75   94.46   95.99  108.00  150.00

$`Foret galerie a strate arbustive`
    Min.  1st Qu.   Median     Mean      3rd Qu.     Max.
  0.2047 150.0000 150.0000 140.8000 150.0000 150.0000

$`Foret galerie ouverte`
   Min. 1st Qu.  Median    Mean    3rd Qu.    Max.
  3.263 134.900 150.000 126.700 150.000 150.000

$`Jachere 2 ans`
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  42.12   42.12   42.12   42.12   42.12   42.12

$`Jachere 4 ans`
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  15.00   21.38   22.91   29.75   30.15   94.31
$`Jachere 5 ans`
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  1.394   3.052  23.030  37.610  30.780 150.000

$Plain
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
 0.2963  0.3245  1.7170  1.5850  2.2130  3.4780
```

$`Savane arbustive ouverte`

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
0.6706	9.7500	19.9000	38.0900	46.1800	150.0000

$`Savane arbustive ouverte brulee`

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
0.2749	6.9550	14.6200	28.8200	24.7200	150.0000

$`Savane boisee a strate arbustive`

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
9.076	43.570	110.600	95.620	150.000	150.000

$`Savane boisee a strate arbustive brulee`

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
18.37	18.37	39.33	50.55	39.33	121.30

$`Savane boisee ouverte`

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
0.4528	21.1200	70.0100	77.3200	150.0000	150.0000

$`Savane boisee ouverte brulee`

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
1.954	1.954	8.324	23.380	46.400	62.900

$`Savane herbeuse`

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
0.2047	0.3834	2.4050	9.6750	6.7430	98.8600

$`Savane herbeuse brulee`

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
0.2826	0.4783	2.2090	9.5950	12.3900	59.2800

The cross referencing with the field observations provide a basis for the thresholds chosen for the habitat distinction and change analysis, with herbaceous savanna having median biomass values of around 2 tonnes per hectare, open wooded savanna of around 40 tonnes per hectare, the rotational fallows of between about 2and 42 tonnes of biomass per hectare (thus confusing these two habitat types) and with forest pixels having median biomass value of 95 to 150 tonnes per hectare.

Badiar: change rate estimation

With the definition of forest loss set at a consistent fall in estimated biomass values from 145 tonnes per hectare to below at least 40 tonnes per hectare, the rate of change is estimated to be 0.6% annually 2007-2010. By using a less conservative lower forest threshold, at 60 tonnes per hectare, the estimated forest loss / degradation rate increases to 1.1 % per year over the same time period. This approach provides more sensitivity to change (capturing degradation) but increases the likelihood of false positives.

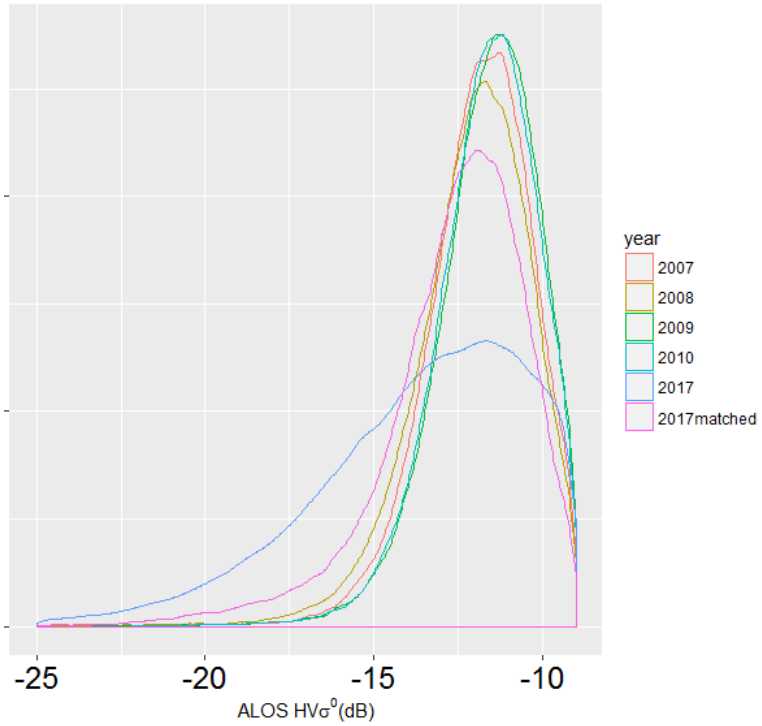
Bafing: assessment of biomass map 2017 against field observations

	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
Champ	33.87,	83.43,	114.00,	108.6,	149.30,	150.00
Foret a strate arbustive	32.26,	91.32,	150.00,	126.3,	150.00,	150.00
Foret bambous	8.24,	8.267,	52.670,	57.24,	63.30,	150.000
Foret claire	63.8,	63.75,	94.46,	95.99,	108.00,	150.00
Foret galerie a strate arbustive	0.20,	150.00,	150.00,	140.8,	150.00,	150.00
Foret galerie ouverte	3.30,	134.90,	150.00,	126.7,	150.00,	150.000

As with the Badiar site, cross referencing the forest biomass estimation against field observations indicated that the method was appropriate as means to distinguish higher biomass forested classes, which had median values of 150 tonnes per hectare (but lower median values for the anthropogenic bamboo forests and foret-claire categories).

Bafing: histogram matching over stable forest patches

Following implementation of the histogram matching algorithm, pixels were extracted over stable forest areas in order to test for the same distributions across the two sensors (PALSAR 1 and 2). The figure below shows the distribution of the 2017 backscatter values before (blue) and after (pink) the matching procedure, where the histogram of the matched values is of a similar form to the PALSAR-1 data over the same pixels.



Bafing: change detection analysis.

For a rule based classification of Bafing, the thresholds were set with a lower biomass category for savanna at <20 tonnes per hectare; a medium biomass category to capture the fallow-agricultural rotation category of between 20 and 40 tonnes per hectare, and a higher biomass forest category of at least 145 tonnes per hectare. Forest lost required a pixel to fall consistently from the higher biomass category to consistently below 40 tonnes per hectare. Using these thresholds, the forest loss rate was 0.2% per year for 2007-10, and 0.3% year for 2010-2017.

By using a less conservative lower forest threshold, at 60 tonnes per hectare, the estimated forest loss / degradation rate increases to 0.5 % per year 2007-10 and 0.8% per year between 2010-17. This approach provides more sensitivity to change (capturing degradation) but increases the likelihood of false positives.

Errors and conclusions

For each of the sites, assessment of the distribution of pseudo-invariant pixel values was undertaken, indicating overlapping distributions, and reducing the likelihood of errors (false detections) due to non-anthropogenic changes e.g. moisture levels. The application of the multi-channel filter reduces the likelihood of errors due to speckle (noise) in the SAR data. Finally, by using conservative thresholds for change detection, we reduce the likelihood of errors of remaining errors in the data creating false positives.

The biomass estimations for each year were used as a means to distinguish habitat types in each of the study sites, and should be used as such rather than a high accuracy assessment of biomass in the landscape, which would require field plots against which to calibrate the SAR data. Nevertheless,

similarity in habitat types between the study sites in Mitchard *et al*. (2009) and the Guinea sites (tropical low biomass woodland) suggests that we may expect a similar functional form here.

References

Mitchard, E. T. A., S. S. Saatchi, I. H. Woodhouse, G. Nangendo, N. S. Ribeiro, M. Williams, C. M. Ryan, S. L. Lewis, T. R. Feldpausch, and P. Meir (2009), Using satellite radar backscatter to predict above-ground woody biomass: A consistent relationship across four different African landscapes, Geophys. Res. Lett., 36, L23401, doi:10.1029/2009GL040692

Richards and Jia: Remote Sensing Digital Image Analysis. Springer, Berlin, Heidelberg, Germany, 439pp.

Quegan, S, and Jiong Jiong Yu. "Filtering of multichannel SAR images." *IEEE Transactions on Geoscience and Remote Sensing* 39.11 (2001): 2373-2379.

Appendix 3 Scenarios for forecasting potential impacts of the Koukoutamba Dam

Four scenarios were used to forecast the approximate scale of impacts on chimpanzees if the Koukoutamba dam were to go ahead; see Section 4.4.1.1 for further information. The scenarios are summarised in Table 22 and discussed in more detail below.

Table 22: Scenarios of impacts from the Koukoutamba dam and number of chimpanzees within the proposed Moyen Bafing Protected Area (MBPA) that could be lost.

Scenario	Description	Potential consequences	Impact scenario	Area impacted (km^2) [1]	Number of chimpanzees lost (all individuals, rounded to the nearest 50)	Likelihood of scenario happening
1	Construction of Koukoutamba dam proceeds according to international good practice for biodiversity and social impacts; The Koukoutamba dam and most of the periphery of the reservoir are included inside the proposed MBPA; Effective management of MBPA is established *prior* (2-5 years) to dam construction. Good collaboration between OMVS / contractor, government, MBPA, communities; Any resettlement due to the dam is either within existing village territories, or to outside the MBPA;	Direct impacts of Koukoutamba dam reduced to as low as reasonably feasible; Associated development occurs outside of core protected areas; Hunting effectively controlled; Habitat clearance / degradation due to in-migration and induced access restricted to targeted development area.	Direct impacts to chimpanzees are equivalent to complete loss in a 2km buffer around the dam and the reservoir; Indirect impacts are equivalent to a complete loss within a 1.5 km-wide corridor along the principal access road.	576	275-450	Moderate
2	Construction of Koukoutamba dam proceeds broadly according to international good practice for biodiversity and social impacts; The Koukoutamba dam and most of the periphery of the reservoir are included inside the proposed MBPA; Effective management of MBPA is established *prior* (2-5 years) to dam construction. Good collaboration between OMVS / contractor, government, MBPA, communities;	Direct impacts of Koukoutamba dam on chimpanzees extend beyond predicted impact significance; Associated development occurs outside of core protected areas; Hunting effectively controlled; Habitat clearance / degradation due to in-migration and induced access restricted to targeted development area.	Direct impacts to chimpanzees are equivalent to complete loss in a 3km buffer around dam and reservoir; Indirect impacts are equivalent to a complete loss within a 2.5 km-wide	743	350-550	High

	Any resettlement due to the dam is either within existing village territories, or to outside the MBPA;		corridor along the principal access road.			
3	Construction of Koukoutamba dam not aligned with international good practice for biodiversity and social impacts; The Koukoutamba dam and most of the periphery of the reservoir are included inside the proposed MBPA; Management of MBPA only begins during dam construction. Partial collaboration between OMVS / contractor, government, MBPA, communities; Any resettlement due to the dam is either within existing village territories, or to outside the MBPA;	Direct impacts of Koukoutamba dam on chimpanzees extend beyond predicted impact significance ; Development activities, especially agricultural development, are not well managed and more extensive, including areas in proximity to the reservoir as well as being more extensive along the access road; Hunting partially controlled; Habitat clearance / degradation due to in-migration and induced access is extensive along access road and around reservoir.	Impacts to chimpanzees are equivalent to complete loss in a 4km buffer around dam and reservoir; Indirect impacts are equivalent to a complete loss within a 5 km-wide corridor along the principal access road.	982	500-700	Moderate
4	Construction of Koukoutamba dam not aligned with international good practice for biodiversity and social impacts; The Koukoutamba dam and most of the periphery of the reservoir are included inside the proposed MBPA; Management of MBPA only begins after dam construction or is significantly delayed. Weak collaboration between OMVS / contractor, government, MBPA, communities; Resettlement may be within proposed MBPA or limits of MBPA may need to be reduced;	Direct impacts of Koukoutamba dam on chimpanzees extend beyond perdicted impact significance; Development activities, especially agricultural development, are not well managed and more extensive, including the proximity to the reservoir as well as being more extensive along the access road; Hunting not controlled; Habitat clearance / degradation due to in-migration and induced access is very extensive along access road and around reservoir.	Impacts to chimpanzees cover a 4km buffer around dam and reservoir; Hunting impacts are equivalent to eliminating wildlife from a 10 km buffer each side of the principal access road (habitat clearance is included within this).	1265	600-950	Low-Moderate

[1] Some of the buffers modelling impacts overlap, these figures are the net impact.

Footprint impacts are estimated to be the same for each scenario. The degrees of variability concern indirect impacts and impacts of increased inter-group encounters.

Scenario 1

Indirect impacts

An optimistic scenario would see the indirect impacts effectively managed due to the inclusion of the dam and the reservoir inside the proposed MBPA, effective collaboration between dam developers and protected area management, and implementation of effective protected area management starting well before the onset of construction activities.

In this scenario, indirect impacts are estimated as being equivalent to complete loss within a 1.5 km buffer around the main road coming from Kollè going to Kalinko, which is expected to be upgraded for the project (Tractebel Engineering 2012). This buffer was based on the fact that most indirect impacts usually occur close to roads. It is therefore hypothesized that an increase in habitat loss and hunting would occur in the vicinity of the road. Under this scenario, the Koukoutamba project would be included within the MBPA, and thus it is expected that indirect impacts would be effectively managed.

Inter-group encounters

Even under a best-case scenario we would still envisage direct impacts over and above footprint impacts due to increased mortality (and reduced reproductive success) due to intergroup encounters produced when chimpanzee communities that lose part of their territory expand their territory to compensate and so move into neighbouring chimpanzee's territory. In such instances, an increase in intergroup encounters is expected which may lead to the loss of individuals (Boesch *et al*. 2008; Mitani *et al*. 2010).

Intergroup encounters have not been studied in the context of hydroelectric dam development, nor in the context of forest-savanna mosaic habitats like those comprised within the MBPA. However, in the context of industrial logging this effect has been associated with ape population declines of 40-90% (White & Tutin 2001; Morgan & Sanz 2007). Chimpanzee territory size can vary according to the habitat type, food availability and community size, but it has been estimated to range from approximately 25 km^2 in dense forest (Herbinger *et al*. 2001) to 60 km^2 in drier environments (Pruetz & Bertolani 2009). Over very long time periods it is also possible that the population could stabilize over time and even recover if baseline conditions can be returned to (for example returning to similar background rates of hunting and deforestation). However this could only happen over a very long time period since chimpanzee generation time is over 20 years (Langergraber *et al*. 2012) and multiple generations would be required for stabilisation. For the purposes of this assessment which focuses on a 20 year offset we assumed no recovery.

In this scenario, we used an estimate of complete loss of chimpanzees within a 2km buffer around the reservoir, effectively assuming loss of the same number of chimpanzees around the reservoir as under it. This is based on assuming a 25km^2 home range on average and hence a

5km diameter on average and that inter-group encounters and lower territory quality may result in a 40% loss for all chimpanzee communities that immediately border the reservoir. The actual impacts will depend heavily on the timing of reservoir filling, the precise number of chimpanzee groups and the configuration of their territories (which in reality are not likely to be homogenous in extent or shape).

Scenario 2

Indirect impacts

Under this scenario, the project would support development activities within defined development zones along the principal access road and outside of the core protected areas.

Indirect impacts would still be expected to be reasonably effectively managed due to the inclusion of the dam and the reservoir within the MBPA. However, it would be predicted that more substantial development activities would occur along the main upgraded road, equivalent to complete loss within a larger buffer (2.5 km) to account for further habitat loss. The main signs of anthropogenic activities recorded throughout the landscape during the WCF survey were of forest product exploitation (WCF 2016a), with few signs of hunting Therefore this scenario assumes an increase in existing threats (i.e. forest product exploitation), and not a significant hunting pressure towards chimpanzees.

Inter-group encounters

Direct impacts to chimpanzees would be more significant than originally predicted, with a higher proportion of chimpanzee core areas flooded and a higher rate of chimpanzee inter-group encounters. Therefore, direct impacts are assessed as being equivalent to complete loss in a 3km buffer around the reservoir and dam, based on a 60% loss in each chimpanzee community bordering the reservoir for a 25km^2 average home range, or equivalently that home ranges are larger than 25km^2 so impacts extend further from the reservoir.

Scenario 3

Indirect impacts

This scenario is similar to the previous scenario, however the effective management of the protected area would only begin after the onset of construction activities. It is therefore predicted that development activities would be only partly effectively managed, and that would occur along the road and around the reservoir (especially agricultural activities). Therefore, the buffer around the reservoir has been increased to assuming a complete loss within 4km to account for further unmanaged impacts during that time.

Un-managed indirect impacts would also lead to further habitat loss and degradation along the main road. Increased hunting pressure, especially towards primates, could be expected if there is an influx of people from Guinée Forestière who do not have the same taboos against killing and eating primates. During the site visit, people interviewed in different villages mentioned that

hunters from Guinée Forestière already come to this area to hunt. An average hunting territory has been estimated at between 16 and 25 km^2 in the Fouta Djallon (Dufour 2013). However, hunters are known to travel long distances, especially if these hunters were to come from areas outside of the MBPA. Therefore, the buffer along the main road has been increased to being equivalent to a complete loss within 5km to include a greater impact related to induced access and more specifically from habitat loss and hunting.

Inter-group encounters

In this scenario inter-group encounters are considered to be equivalent to complete loss in a 4km buffer around the reservoir. Increased mortality from intergroup encounters in this scenario would be due to 1) significant disturbance in the area to be flooded prior to flooding (for example due to planned or unplanned felling of timber trees in advance of flooding), 2) home ranges larger than 25km^2 so that impacts of displacement extend further from the reservoir.

Scenario 4

Indirect impacts

The worst-case scenario assume the same buffer around the dam and the reservoir as was used in the 'intermediate' scenario, however the main difference is that the effective management of the MBPA would only occur at the end of construction activities or at a later time. Therefore, indirect impacts would be expected to be significantly greater and thus the buffer around the main road has been increased to being equivalent to complete loss of chimpanzees within 10 km to account for un-managed indirect impacts related to induced access, mainly through an increase in hunting of chimpanzees.

Intergroup encounters

Same as for scenario 3.

Appendix 4 Field visit timing and overview

TBC and INSUCO carried out a site visit and recce in January/February 2017. Figure 10 shows the routes taken by each team and Table 23 the villages visited.

Table 23 gives dates, names of villages/communities and specific people who the teams met with (with institutional affiliations where relevant), and major subjects of discussion in each case.

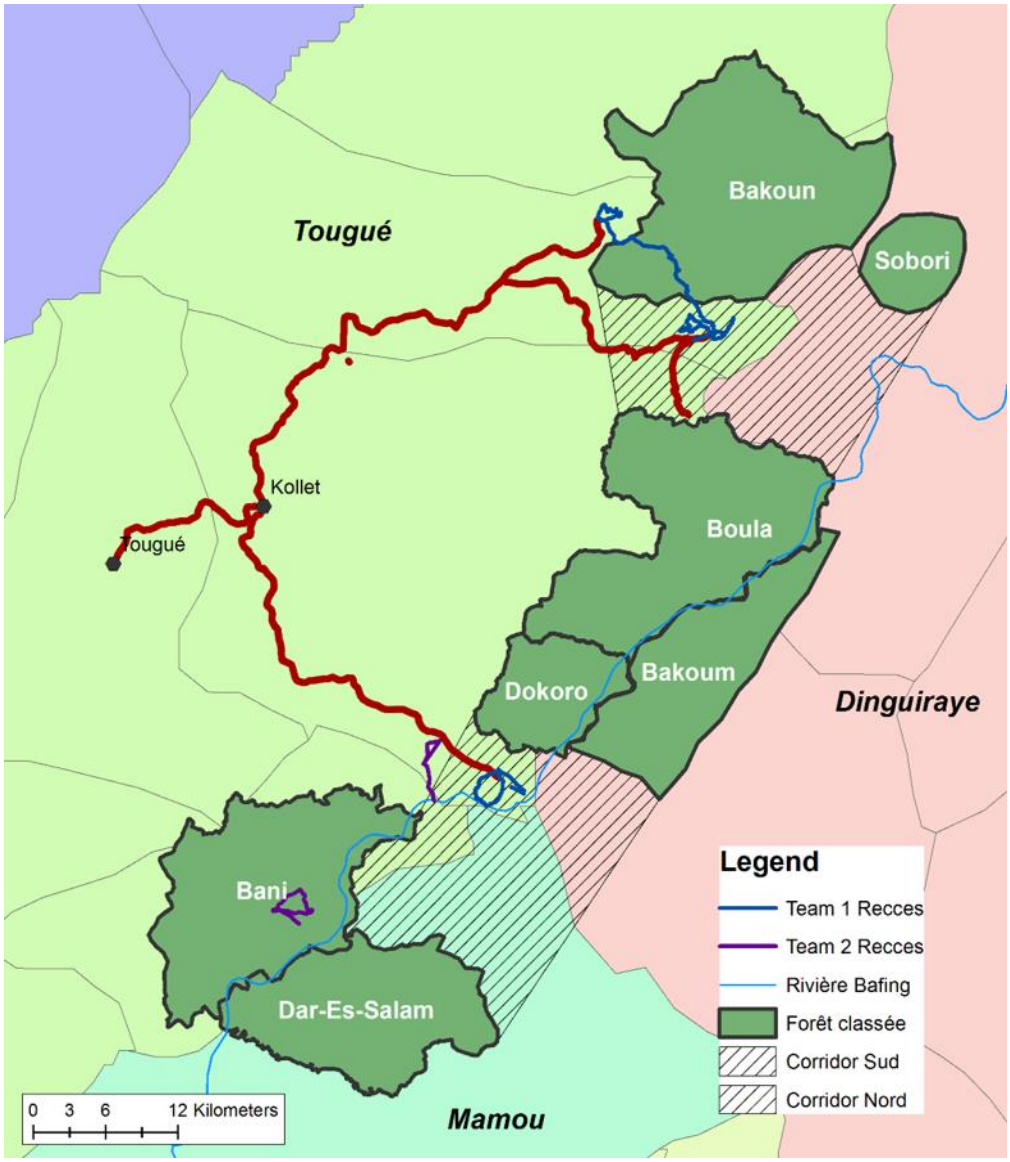


Figure 10: Routes taken by the TBC and TBC/INSUCO teams on the site visit and recce in January/February 2017

Table 23: Field visit schedule, community and people visited, and major points of discussion

Date	Lieu	Personnes rencontrées	Points saillants de discussion
27/01/2017	Labé	Alpha Ibrahima Barry *Inspecteur régional de l'environnement, des eaux et forêts*	Présentation de la mission et de ses objectifs
28/01/2017	Tougué	El. H. Arafan Mory Ali Oularé *Secrétaire général chargé des collectivités décentralisées au niveau de la préfecture*	Présentation de la mission et de ses objectifs
	Kollet	Dr. Ibrahima Sory Keita *S/P de Kollet*	Présentation de la mission et de ses objectifs
	Kourantango	Malal Baldé *Directeur préfectoral de l'environnement de Tougué* Michel Kamano *S/P de Kourantago* Amadou Baldé *Maire de Kourantango* Mariana Baldé *Conseillère du maire* Aussi présent : présidents districts, membres districts, enseignant, direction S/P de la jeunesse, chef cantonnement forestier et son équipe, ONGs (incluant l'association des jeunes pour la protection de l'environnement à Kourantango, association locale pour la conservation de la nature)	Création, statut et utilité des forêts classées et des forêts communautaires Problèmes environnementaux de la zone (la déforestation est identifiée comme un problème majeur due à la coupe de bois et aux feux de brousse) Cohabitation entre les chimpanzés et l'homme dans la région Chasse peu pratiquée car peu d'animaux Certains chasseurs viennent de Tougué et Kollet, ou aussi de Guinée forestière Gestion de l'élevage et problématiques de pâturage Produits cultivés et vendus (ex. riz, arachide, fonio, sorgho) au marché Projets de développement et initiatives qui ont été réalisés dans la région : points forts comme le soutien aux cultures maraîchères, les forêts communautaires, l'amélioration de l'accès à

Date	Lieu	Personnes rencontrées	Points saillants de discussion
			l'eau; et les points faibles comme par exemple la culture de la pomme de terre et des piments car les insectes se sont attaqués aux cultures Évoque leurs préoccupations pour pallier à la pauvreté dans la zone (ex. manque d'eau pour la culture maraîchère, besoin de ruche kenyane, besoin en routes, parc à bœufs, augmentation du rendement pour l'agriculture)
29/01/2017	Dounkita	Alpha Keita *Chef secteur* Aussi présents : représentants de la jeunesse, agriculteurs et chasseurs	Historique du village Activités principales (principalement l'agriculture) Cohabitation entre les villageois et les chimpanzés (et autres singes) Discute du projet PGRN et de l'accès contrôlé à la forêt classée de Bakoun durant cette période Un comité de gestion et surveillance était en place durant le projet PGRN, et était composé de personnes provenant des villages bordant la forêt Dès la fin du projet il y a eu beaucoup d'agression sur la forêt (chasse, agriculture et coupe de bois) Problématiques d'agriculture : accès aux terres, rendement et irrigation Manque d'infrastructures sociales de base (eau, santé, école, routes, réseau téléphonique)
		Entretien avec les femmes	Les produits consommés localement et ceux devant être achetés au marché Kollet Consomme peu de protéines, pas d'accès au poisson frais et mange de la viande de bœuf

Date	Lieu	Personnes rencontrées	Points saillants de discussion
			rarement (la viande de brousse se gagne rarement) Accès à l'eau potable difficile car la pompe ne fonctionne plus, puise l'eau de la rivière Collecte des fruits sauvages et le bois de chauffe (à environ 1-3h de marche) Activités réalisées par les femmes (culture maraîchère, collecte des fruits sauvages comme le néré et le karité, transformation des produits récoltés, collecte de bois de chauffe, cherche l'eau à la rivière) Interactions entre les femmes et les chimpanzés : les croisent souvent à la rivière et si elles ont peur des chimpanzés Utilisation de plantes médicinales peu fréquente Manque de scolarisation
30/01/2017	Laffa	M. Diallo *Président de district* Aussi présents : notables du village	Présentation de la mission et de ses objectifs
31/01/2017	Laffa	M. Diallo *Président de district* Aussi présents : représentants de la jeunesse, anciens travailleurs du PGRN, éleveurs, agriculteurs et chasseurs	Historique du village Mode de vie et interactions avec la forêt (chasse et intrusion agricole) Discussion sur la chasse de subsistance (ex. espèces chassées, zone couverte) Activités réalisées du temps du PGRN (suivi des populations animales, surveillance, projets de développement) Difficultés de gestion de la forêt avec les villages avoisinants (ex. coupe de bois illégale dans la forêt classée)

Date	Lieu	Personnes rencontrées	Points saillants de discussion
			Règles et coutumes locales pour la protection de la forêt Persistance des techniques agricoles instaurées par le PGNR Produits cultivés et méthodes d'agriculture Insuffisance de terres fertiles pour l'agriculture autour du village
		Entretien avec les femmes	Ressources prélevées dans l'environnement (bois de chauffe, fruits sauvages dont le karité et le néré) Peu de rendement des cultures Culture maraîchère peu développée car manque de matériel Accès à l'eau : un forage pour le village insuffisant pour tout le village Problèmes d'écoulement des produits car ils n'ont pas de marché local proche Interactions entre les femmes et les chimpanzés Besoins d'appui pour des activités génératrices de revenu (ex. saponification et transformation du beurre de karité) et pour la culture maraîchère (semence et moto-pompe)
01/02/2017	Niandoya	Amadou Baïlo Baldé *Chef secteur* Aussi présents : sages du village et représentants de la jeunesse	Historique du village Principales activités réalisées (agriculture, chasse et élevage) Présence d'une forêt communautaire près du village Présence des chimpanzés et autres singes près du village Usage local des ressources de la forêt

Date	Lieu	Personnes rencontrées	Points saillants de discussion
			Manque d'infrastructures sociales de base Peu d'interactions avec le projet PGRN
03/02/2017	Balabory	Mamadou Kaali Diallo *Chef secteur* Aussi présents : membre du bureau du district de Kégnéoula, sages du village et représentants de la jeunesse	Historique du village Raréfaction de la faune sauvage Principales activités menées par les villageois (agriculture et élevage, chasse occasionnelle) Produits agricoles (arachide, fonio, maïs, riz) Peu de prélèvement des ressources forestières car peu d'opportunités d'écoulement des produits N'effectue pas de pêche dans le Bafing Pas de groupement Difficultés : manque de route, de plus de forage, clôture autour du village)
		Entretien avec les femmes	Interactions de femmes avec leur environnement (collecte des fruits de karité et du néré, bois de chauffe) Abondance des ressources naturelles Produits cultivés localement et achetés au marché de Kalinko Vente de riz, patate douce et maïs au marché Difficultés d'accès à l'eau car un seul forage pour le village Manque de terres cultivables car beaucoup de Bowé dans la zone

Date	Lieu	Personnes rencontrées	Points saillants de discussion
			Interactions des femmes avec les chimpanzés Besoins d'appui pour l'agriculture et la culture maraîchère (moto-pompe, semence, matériel)
04/02/2017	Kollet	Dr. Ibrahima Sory Keita *S/P de Kollet*	Compte-rendu du déroulement de la mission et remerciements
04/02/2017	Tougué	El. H. Arafan Mory Ali Oularé *Secrétaire général chargé des collectivités décentralisées au niveau de la préfecture*	Compte-rendu du déroulement de la mission et remerciements
05/02/2017	Pellel Koura	Fatimatou Diallo *Présidente de l'association locale pour la conservation de la nature* Aussi présents : membre de l'association et sages du village	Ont créé une forêt communautaire avec l'appui de Guinée Écologie, dans le but de préserver la forêt et les chimpanzés La forêt communautaire est gérée par une Association Locale de Conservation de la Nature qui a un statut légal Les activités réalisées : plantation d'arbres fruitiers et surveillance Selon les villageois, il y aurait une abondance élevée de chimpanzés dans la forêt communautaire
06/02/2017	Labé	Alpha Ibrahima Barry *Inspecteur régional de l'environnement, des eaux et forêts*	Discute du projet de parc transfrontalier du Bafing-Falémé et du PGRN Manque de documentation au niveau de l'inspection régionale
		M. Tounkara et M. Hilal *Cadres de la direction préfectorale de l'agriculture*	Techniques agricoles pratiquées dans la région Projet en cours dans la région (Mali, Tougué, Koubia, Labé, Lélouma) Projets : PRAFD, PRADEL et le PNAFA (en cours)

Appendix 5 Governance case studies

Case study: Governance of a carbon project in West Africa

The case study involves the management of a carbon project set up to reduce deforestation and biodiversity loss within a protected area. The project partners include both Government departments and non-government organisations (both national and international). Following a legal review of the governance options, the preferred option for all parties was the establishment of a charitable company and a series of agreements between all the parties to define the roles of all parties, the ownership of carbon rights, the management of the protected area and the distribution of revenues generated by the sale of credits.

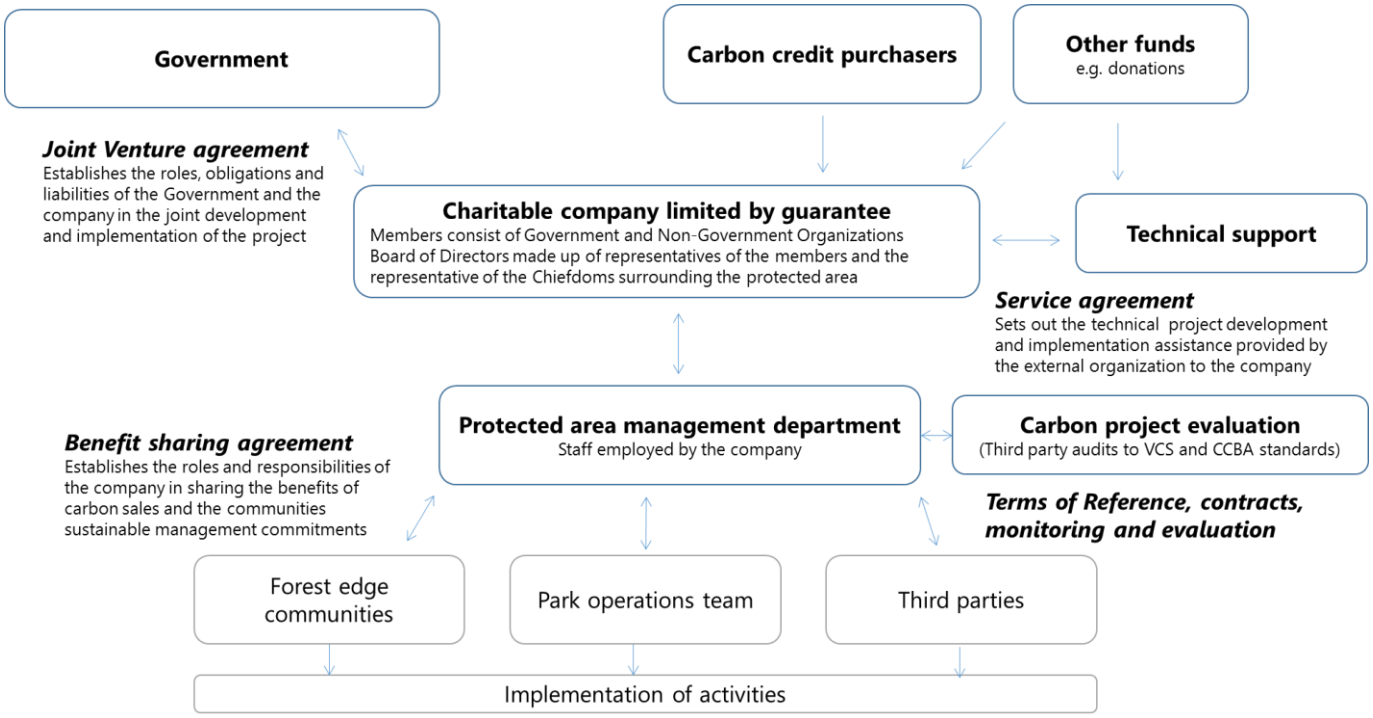


Table 24: Roles of the key parties

Parties involved in the governance structure	Key role
Government	• Transfer management rights and carbon rights for the protected area to the Company for the lifetime of the project • Cooperate with the company in matters related to the project to enable the company to fulfil its obligations
Company	• Develop, register and implement the project to determined standards

	• Sell the credits arising from the actions of the project, receive and use the revenues to implement the project including the distribution of benefits of the Benefit sharing agreement • Provide annual reports to the Government, to include the use of project revenues • Ensure project is aligned with national legislation, policies and guidelines
Technical support	• Develop the documents required for the carbon standards and process the project for validation, registration and verification events. • Assist the company in marketing and negotiation of sale of credits. • Provide technical and management support during implementation

Case study: Governance of a conservation project in Zambia

The case study involves the management of the Liuwa Plain National Park (LPNP) in Zambia. African Parks is a conservation NGO that takes on the direct responsibility for the long term management of protected areas with government and local communities. The governance approach used in all seven countries they work in is based around the establishment of a legal entity in the host country with a board consisting of partner institutions and stakeholder groups that oversees management activities. The governance structure and operations are heavily supported by African Parks and by their affiliated organizations that primarily provide fund raising support.

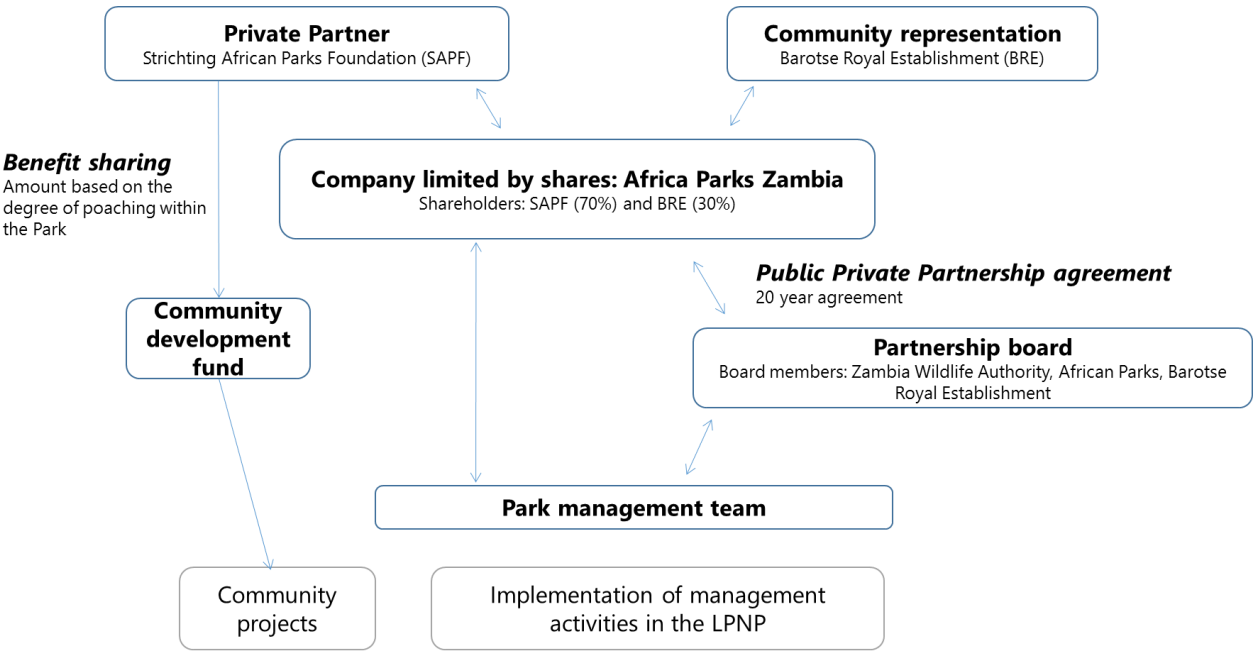


Table 25: Roles of the key parties

Parties involved in the governance structure	Key role
Company: Africa Parks Zambia	• Overall responsibility for the rehabilitation, management and administration of the Liuwa Plains National Park • Designation of roles and responsibilities between partnership board • Upgrading of wildlife tourism development • Benefit sharing with local communities • Recruitment of technical personnel for park operations
Community representation: Barotse Royal Establishment	• Sustainable income generation • Resource protection and monitoring
Government: Department of National Parks and Wildlife / Zambia Wildlife Authority (ZAWA)	• Supplies animals to restock the park, • Provides legislative interpretation to the Park management team
Private Partner: Strichting African Parks Foundation (SAPF)	• Fund raising and awareness raising

Case study: Governance of a biodiversity offset project in Central America

The case study involves the management of three protected areas to generate sufficient biodiversity gains to offset the residual impacts of a mining project. The governance structure is based on the mining company paying into a trust fund for protected area management. The fund was established prior to the requirements of an offset project and has a wider funding remit than just the three offset sites.

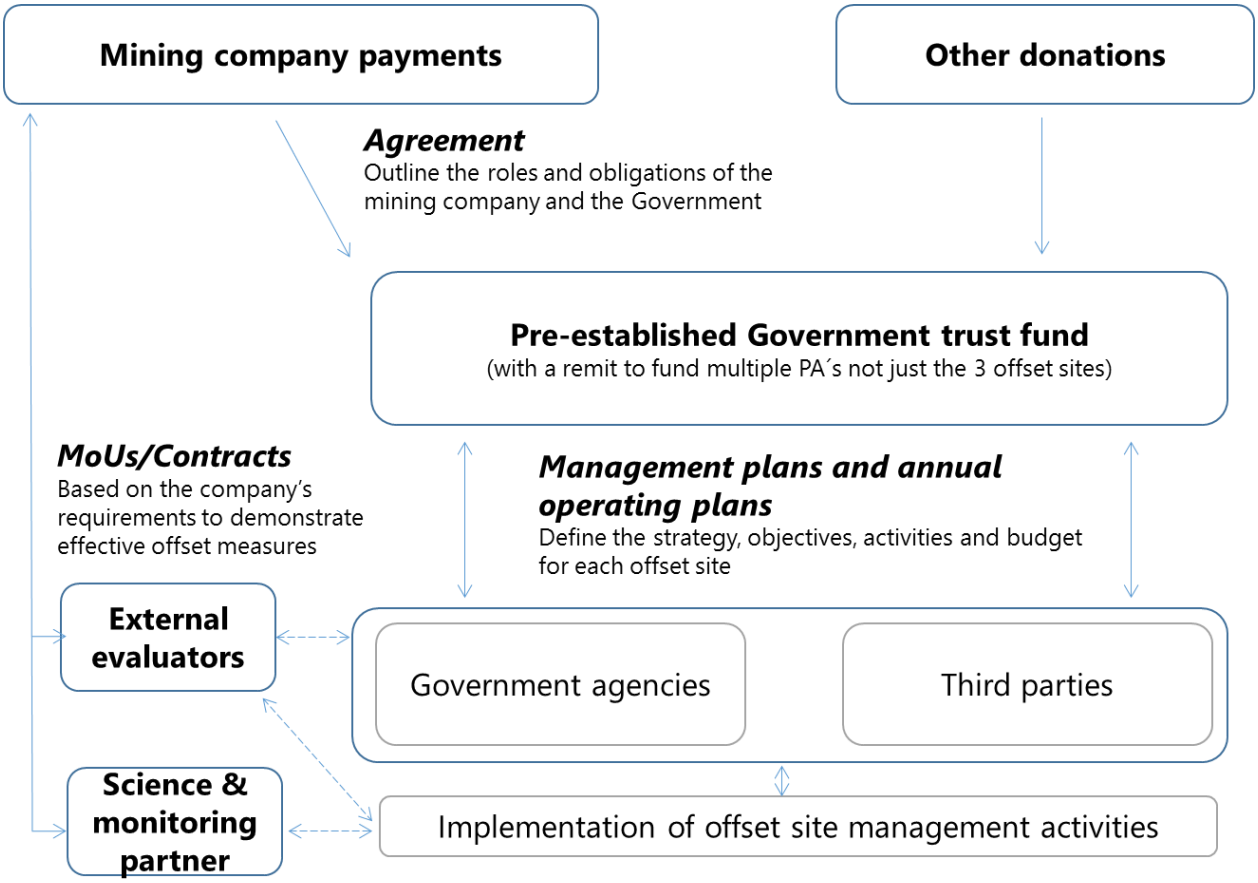


Table 26: Roles of the key parties

Parties involved in the governance structure	Key role
Government	• Management of the trust fund • Development of Management Plans and Annual Operating Plans for each identified offset site to be submitted to the company to release the required funding • Implementation of activities in each offset site via government agencies or third parties • Annual reporting of progress against the site objectives to the mining company
Mining company	• Payments into the trust fund to support the implementation of management and annual operating plans in the 3 identified protected areas until successful mine closure (baseline financial commitments based on average protected area management costs in Central America and to be reviewed and adjusted based on management plans and annual operating costs for each offset site/protected area)

	• Financial support to develop management plans and annual operating plans
External evaluator	• Monitor protected area management activities and their effectiveness
Science and monitoring partner	• Biological monitoring of defined metrics to demonstrate offset gains

Appendix 6 Financial estimates for MBPA set-up and 20 years of operation

Table 27: Detailed setup and establishment phase costs

Phase	Component	Expected outcome	Activity	Justification / key assumptions - low scenario	Justification / key assumptions - high scenario	Low (USD)	High (USD)	Average (USD)
Set-up - 18 months	**Launch PA creation and offset process**	**High level GoG agreement for protected area establishment, overarching principles defined and included in an updated fiche de projet**	WCF/OGUIPAR mMeetings and discussions, further data analysis	2 x Conakry meetings for 4 people, 15 days legal/consultant support	3 x Conakry meetings for 4 people, 25 days consultant support	53,000	83,000	
			Consultancy support to organise meetings, technical input presentations etc	20 days legal / consultant support	30 days legal / consultant support	28,000	42,000	
	Protected area technical design	**Detailed technical design is complete, leading to development of a framework management plan with detailed theory of change and protected area monitoring requirements**	Complementary ecological baseline data collection, spatial modelling	WCF/OGUIPAR field team + 80 consultant days support	WCF/OGUIPAR field team + 100 consultant days support	130,000	195,000	
			Supplementary socio-economic assessments (including: agricultural assessment, PS5 assessment, design of consultation and consent process)	WCF/OGUIPAR field team + 120 consultant days support	WCF/OGUIPAR field team + 150 consultant days support	344,000	412,000	
			Local stakeholder engagement	2-3 Meetings in 26 high priority villages, 40 medium priority and 60 lower investment villages	3-5 Meetings in 52 high priority villages, 50 medium priority and 60 lower investment villages	234,000	444,000	
			Develop framework management plan with indicative actions	Staff costs and consultancy support to develop conceptual model, theory of change and adaptive management framework - 60 days	Staff costs and consultancy support to develop conceptual model, theory of change and adaptive management framework - 90 days	88,636	124,455	
			SEIA based on framework management plan	Staff costs and consultancy support to write SEIA based on data and engagement		120,000	240,000	

Phase	Component	Expected outcome	Activity	Justification / key assumptions - low scenario	Justification / key assumptions - high scenario	Low (USD)	High (USD)	Average (USD)
			GoG and International stakeholder engagement	2 x Conakry meetings for 4 people, 15 days legal/consultant support	3 x Conakry meetings for 4 people, 25 days consultant support	53,000	83,000	
			Establish PA management consortium	2 x Conakry meetings for 4 people, 15 days legal/consultant support	3 x Conakry meetings for 4 people, 25 days legal/consultant support	53,000	83,000	
	Early conservation actions	**Highest priority threats to chimpanzees addressed where appropriate to deliver early gains**	Implement early conservation actions	10% of future on-going costs	15% of future on-going costs	154,480	413,373	
	Offset design and functioning	**Protected area project aligned with offset principles and company needs**	Establish offset oversight panel	Consultant support to establish TORs, recruit members, hold first two meetings - 3 panelists	Consultant support to establish TORs, recruit members, hold first two meetings - 5 panelists	45,000	91,000	
			Update loss-gain forecast based on management plan, finalise aggregation mechanisms, offset monitoring plan	20 days legal / consultant support	30 days legal / consultant support	28,000	42,000	
			Establish financial mechanism	20 days legal / consultant support	30 days legal / consultant support	28,000	42,000	
	Total setup costs					**1,359,117**	**2,294,828**	**1,826,972**
Establishment - 2 years	**Equipment and infrastructure**	**Equipment and infrastructue requirements for functioning established**	Equipment purchase	6 4WD vehicles, 20 motorbikes, 85 sets of field equipment, 20 sets IT equipment	9 4WD vehicles, 30 motorbikes, 140 sets of field equipment, 30 sets IT equipment	521,800	808,700	
			Infrastructure	1 base camp, 4 field camps	2 base camps, 4 field camps	360,000	600,000	
	Finalise consultations	**Final limits defined based on consultation and consent of local communities**	Detailed consultation and consultation and consent	Community meetings, consultancy support for 26 high priority, 40 medium priority and 60 lower priority villages. Assumes 60 days intl socio consultant support overall, then + 8 days national consultant and 32 days national field assistant per high priority village. 25%	Community meetings, consultancy support for 52 high priority, 50 medium priority and 60 lower priority villages. Assumes 80 days intl socio consultant support overall, then + 8 days national consultant and 32 days national field assistant per high priority village. 25%	1,187,200	1,916,800	

Phase	Component	Expected outcome	Activity	Justification / key assumptions - low scenario	Justification / key assumptions - high scenario	Low (USD)	High (USD)	Average (USD)
				costs for per medium and 10% per low priority village NB assumes no physical resettlement is necessary	costs for per medium and 10% per low priority village NB assumes no physical resettlement is necessary			
	Institutional set up and final PA creation	**Legal management plan defined and approved, local management institutions functional, final legal status obtained**	Local institutional set-up			50,000	90,000	
			Detailed Plan d'Aménagement and Plan de Gestion, Decret presidentiel	Meetings and consultations	Meetings and consultations	140,000	210,000	
	Early conservation actions	**Core staff recruited and trained, highest priority threats to chimpanzees addressed where appropriate to deliver early gains**	Core recruitment and training of staff	Recruitment of senior team (1 international tech advisor, 1 international specialists, 4 national team leaders) for two years	Recruitment of senior team (1 international tech advisor,2 international specialists, 6 national team leaders) for two years	376,000	524,000	
			External consultancy support for set-up of SMART + GIS system, implementation of social actions etc	80 days including two field visits	120 days including three field visits	112,000	168,000	
			Early conservation actions	10% of annual costs in year 1, 25% in year 2	10% of annual costs in year 1, 25% in year 2	540,681	964,537	
	Offset specific actions	**Verification that management plan and final PA status meet PA requirements**	Oversight by offset advisory panel	2 meetings of panellists per year	2 meetings of five panelists per year	48,000	140,000	
			Review and evaluation, update of loss gain forecast, review compared to design requirements	20 days consultancy support annually by offset advisor	35 days consultancy support annually by offset advisor	28,000	42,000	
	Total establishment costs					**3,363,681**	**5,464,037**	**4,413,859**

Table 28: Detailed recurrent costs during operation

Component	Item	Description (low and high scenarios)		Low	High	Average
		Low scenario	High scenario	(US$)	(US$)	(US$)
Conservation actions	**Conservation actions**			**544,709**	**1,095,314**	**820,011**
	Field costs for ecoguard patrols, outreach team work etc	Food, per diem and consumables for field missions @ $8/person/day for 100 field days / team member year	Food, per diem and consumables for field missions @ $15/person/day for 130 field days / team member year	76,800	313,950	
	Community engagement and communication	Materials and consumbales for engagement with 26 high priority villages, 40 medium priority aznd 60 lower priority villages	Materials and consumbales for engagement with 52 high priority villages, 40 medium priority aznd 60 lower priority villages	37,000	65,000	
	Community development activities	Average annual investment of $10k year for 26 highest priority villages, $2K/yr for 50 medium priority villages, $500/year for 60 lower priority villages	Average annual investment of $10k year for 26 highest priority villages, $2K/yr for 50 medium priority villages, $500/year for 60 lower priority villages	370,000	650,000	
	Monitoring and evaluation	Equipment and supplementary field costs for monitoring and evaluation, including 40 days international specialist	Equipment and supplementary field costs for monitoring and evaluation, including 60 days international specialist	60,909	66,364	
Running costs	**Total running costs**			**331,033**	**556,167**	**443,600**
	Infrastructure maintenance costs	12% of capital cost per year	15% of capital cost / year	43,200	90,000	

Component	Item	Description (low and high scenarios)		Low	High	Average
	Vehicle replacement (depreciation)	Annualised cost of renewal of 6 4x4s every 5 years on average; Renewal of 20 motorbikes every 3 years	Annualised cost of renewal of 9 4x4s every 5 years on average; Renewal of 30 motorbikes every 3 years	66,667	100,000	
	Vehicle running costs			138,000	207,000	
	Insurance	Insurance fees, forfait	Insurance fees, forfait	10000	25,000	
	Office running costs (telephone, internet, post, office supplies)	1 base camp, 4 field camps	2 base camps, 4 field camps	18,000	36,000	
	Field consumables	Other field conumables not included in conservation actions	Other field conumables not included in conservation actions	15,000	30,000	
	Field equipment replacement (depreciation)			18,000	27,000	
	IT equipment replacement	Replacement every 3 years	Replacement every 3 years	17,167	26,167	
	Audit	Audit fees, forfait	Audit fees, forfait	5,000	15,000	
Staff costs	**Total training and staffing of protected area**			**582,060**	**937,340**	**759,700**
	Protected area implementation staff salaries and benefits	International technical advisor, two international specialists, 8 national team leaders, 85 ecoguards, social staff, support staff and assistants	International technical advisor, four international specialists, 12 national team leaders, 144 ecoguards, social staff, support staff and assistants	477,200	750,800	
	Staff training	5% of wage bill	5% of wage bill	23,860	37,540	
	Consultant support	10 days international consultant and 50 days national consultant per year	25 days international consultant and 100 days national consultant per year	34,000	75,000	
	National travel	Travel to and from Conakry / place of recruitment for senior national staff	Travel to and from Conakry / place of recruitment for senior national staff	10,000	15,000	

Component	Item	Description (low and high scenarios)		Low	High	Average
	International travel	2 per year for each international employee + five consultants/support flights	2 per year for each international employee + seven extra flights	22,000	34,000	
	Government oversight			15,000	25,000	
Offset specific costs	**Total offset specific costs**			**87,000**	**167,000**	**127,000**
	Offset advisor - third party review and preparation of annual offset monitoring and evaluation report	Preparation of annual offset monitoring and evaluation report only. Field visit only every second year. One socio and one ecological consultant for 20 days /year	Enhanced consultancy support including annual field visit and quarterly workplan review. One socio and one ecological consultant for 35 days/year	75,000	132,000	
	Offset oversight panel	Three unpaid panel members, meeting once per year	Five unpaid panel members meeting once per year	12,000	35,000	
	Total annual recurrent costs (US$)			**1,544,802**	**2,755,820**	**2,150,311**

Table 29: Indicative unit costs

Category	Item	Unit cost (USD)	Number required - Low scenario	Number required - high scenario
Equipment	4x4 vehicle	50,000	6	9
	Motorbike	1000	20	30
	Field equipment (1 person - tent, radio, binoculars, rucsac, GPS, radio, compass etc)	1800	83.5	139
	IT equipment	2500	20.6	31.4
	4x4 annual running costs (fuel + maintenance)	16000	6	9
	Motorbike annual running costs (fuel and maintenance)	2100	20	30
	Food, per diem, consumables per person per day for field missions - daily rate		8	15
Running costs	Field days per person per year		100	130
	Base camp	120,000	1	2
	Ecoguard base	60,000	4	6
Infrastructure	Infrastructure maintenance %		12	15
	International technical advisor (year)	100000	1	1
	International specialist (year)	60,000	2	4
	National team leader / senior adminstration manager (Master-level)	7,000	8	12
	Field assistant (degree level)	4,500	24	36
	Senior ecoguard/field worker (BEPC level) + Drivers + Mechanics	1,200	36	64
	Village assistant	2,000	25	44
	National consultant	400	50	100
Staff	International consultant (day)	1400	10	25
	Offset oversight panel members		3	5
	Offset oversight panel frequency (set-up)		2	2
	Offset oversight panel frequency (on-going)		1	1
Oversight	Per person cost of offset oversight meeting		4000	7000

Category	Item	Unit cost (USD)	Number required - Low scenario	Number required - high scenario
	Offset advisor during set-up		20	30
	Offset advisor on-going		40	70
	High investment	10000	26	52
	Medium investment	2000	40	50
Villages	Lower investment	500	60	60

Appendix 7 Stakeholder engagement

The desired outcomes of stakeholder consultation were to obtain more information on potential red flags that had been identified during the pre-feasibility study and to gather opinions on the offset site option and the conservation model proposed. This process was undertaken specifically to ensure that:

- All stakeholders:
    - Have a clear understanding of CBG/GAC offset plans
    - Feel that they have been appropriately involved in the process
    - Understand their role going forward
- GAC and CBG / TBC:
    - Understand the views and concerns of key stakeholders
    - Have the opportunity to incorporate stakeholder knowledge/perspectives into the feasibility study

Table 30: List of stakeholders consulted during this study

Name and position	Organization	Rationale for meeting
Mamadi Saiba KEITA, Director Mamadou Bhoye SOW, Deputy Director Bakary MAGASSOUBA, Associate General Director Salian TRAORÉ (WCF/Oguipar) Moussa KABA (WCF/Oguipar)	Office Guinéen des Parcs et Réserves (Oguipar)	• OGUIPAR is developing the national protected area network so it is important to ensure that their plans are considered when assessing the alignment of potential offset sites with their objectives; • OGUIPAR is involved with WCF in conducting the environmental and social studies towards the creation of the proposed MBPA ; and • The management of this offset site might fall under the responsibility of OGUIPAR if a new protected area is created.

Name and position	Organization	Rationale for meeting
Mamadou Saliou DIALLO, Director	Guinée Écologie	• Guinée Ecologie is a key stakeholder as it is the main Guinean registered (1990) NGO focusing on environment and biodiversity conservation; • Guinee Ecologie is working jointly with the Arcus Foundation on the conservation of chimpanzees in the Foutah Djallon, the wider region that encompasses the proposed MBPA; and • Guinee Ecologie is the partner of the COMBO project in Guinea aiming to develop a National Offset Policy.
Adama DAOU Responsable du volet Environnement	United Nations Office for Project Services (UNOPS)	• With funding from the European Union, UNOPS is the one agency building capacity of MEEF to improve management of Guinea's classified forests, parks and reserves. Such support could potentially benefit future protected areas like the proposed MBPA.
Raymond LATASTE Chargé de Programmes Section Gouvernance	Délégation de l'Union européenne en République de Guinée	• The European Union is funding development projects in Guinea, including supporting law enforcement in several protected areas.
Responsible for mining titles	Centre de Promotion et de Développement Miniers (CPDM)	• The CPDM works closely with the National Direction of Mines; • Their role is to prospect mining markets and to assist companies in obtaining mining permits; and • The CPDM has the latest information on active mining companies and on areas likely to be developed in the near future. They were therefore the most relevant source of information to assess potential threats from mining development in the Moyen Bafing landscape.
Hugo Rainey, Director Catherine André-Munch, Guinea Project Manager	COnservation, impact Mitigation and Biodiversity Offsets in Africa (Combo)	• The Combo project is working with Guinée Écologie and Guinean governmental representatives towards developing a national offset policy.

Name and position	Organization	Rationale for meeting
Lansana CONTÉ Counsellor to the Minister on Environment and Vice President of the Offsets Commission	Commission nationale de compensations des dommages aux écosystèmes et à la biodiversité	• As a future National Offset Commission, it will be involved in the design and implementations of all the offset projects in Guinea.
Dr Seydou Bari SIDIBE Secretary General, MEEF Malal Baldé Directeur préfectoral de l'environnement de Tougué	National Direction for Waters and Forests (DNEF)	• Knowledge about the Moyen Bafing area and current conservation status of the seven classified forests present in that area.
Alphadio Doukouré	Direction Nationale de l'Energie	• Knowledge on the status of the Boureya and Koukoutamaba dams that could affect the proposed MBPA.
Mamadou II Diaby, National Coordinator for OMVS in Guinea Sao Sangaré Technical advisor for the Integrated Water Resource Management Program	Organisme pour la Mise en Valeur du Fleuve Sénégal (OMVS)	• Developing the Koukoutamba dam project in the same area as the proposed MBPA
Helga Rainer Director of Conservation Program	Arcus Foundation	• Arcus is funding great ape conservation at priority sites; • There are involved in updating the National Chimpanzee Action Plan; and • Will finance priority projects based on the results of prioritisation of chimpanzee conservation areas.

Name and position	Organization	Rationale for meeting
James Lumley* Chief Executive Officer	Anglo-African Minerals plc	• Overlap of Mintep and Toubal licenses

*We tried to contact him however did not receive any reply.

Similar concerns were raised by different stakeholders and therefore a summary of the main concerns raised is provided in Table 31.

Table 31: Summary of concerns raised by stakeholders

Concerns raised	How to address the issue	Difficulty to address concern
Technical capacity of Oguipar to manage a new protected area	Oguipar is already working closely with WCF, and it is foreseen that another technical adviser or organisation would also be supporting the elaboration and implementation of a management plan for this area.	Somewhat hard
The impacts of the Koukoutamba dam on the proposed MBPA and on chimpanzees	An interministerial commission has already been created in order to consult on activities to be undertaken in the Moyen Bafing area, which include both promoters of the protected area and developers for the dam.	Somewhat hard
Representativeness of the proposed MBPA for other species of conservation concern	The area is likely to harbour other species of conservation concern and further surveys have been planned on different taxa (e.g. birds and plants).	Moderate
Who will manage the fund?	The fund will be managed by a board of administrators and will follow IFC best practice standards.	Easy
How does this offset fits in with the national offset policy that is being developed	The national offset policy is being developed, but will take a few more years to be effective. This offset will act as a 'case study' that will help to guide and provide inputs into the elaboration of the national offset policy.	Easy

Appendix 8 Review of WCF chimpanzee data from Moyen Bafing

The assessment of offset feasibility is based in large part on data provided by WCF, especially surveys of chimpanzee data conducted using the line transect method in 2014 and 2016 (WCF 2016b). We therefore conducted a detailed review of this data, that was provided in raw spreadsheet format to TBC.

Summary of available data

The surveys conducted in 2014 and 2016 covered slightly different areas and were based on different survey designs (Table 32).

Table 32: Comparison of the 2014 and 2016 large mammal surveys and chimpanzee population size estimates

Survey period	Survey area (km^2)	Transects	Survey effort (km)	Decay rate (day)	Chimpanzee population size estimate	
					Weaned chimpanzees	All individuals
2014 survey Dry season (10/2013 to 03/2014)	7 069	185 transects of 2.5 km with a 5.5 km spacing	463	194	4 717	5 542
				221	4 362	Not given
2016 survey Dry season (12/2015 to 03/2016)	-	202 transects (133 transects of 2.5 km with 4 km spacing; and 69 transects of 2.5 km with 2 km spacing)	-	-	-	-
Both survey periods	8 858	Combined different areas using different survey design	500	269		4 365 (3 533-5 393)

Evaluation of data compared to key statistical requirements

A number of requirements need to be met when using the line transect method (Buckland *et al.* 2010) in order for estimates of chimpanzee density to be accurate. In addition to these key assumptions, best-practice standards have been developed for ape surveys to increase the reliability of results (Kühl *et al.* 2008). Table 33 below presents a review of WCF data with respect to these requirements and best practices and the findings are discussed in more detail below. In general, the data collection followed requirements and met best practice standards.

Both the 2014 and 2016 surveys used the systematic line transect methodology, which is commonly used to survey chimpanzees and other large mammal species. The line transect methodology is a robust methodology if its assumptions are not violated.

When using indirect signs of presence to estimate population size, covariates need to be estimated in order to convert these indirect signs into a number of individuals. In this case, the nest degradation rate and the nest production rate need to be estimated since the signs recorded are chimpanzee nests. A constant value used of 1.14 nests per weaned individual per day (Kouakou *et al.* 2009) was used. This is standard practice, due to the difficulty of obtaining data on nest production.

During the 2014 survey, a nest decay rate study for the site had not yet been conducted and instead nest decay rates from other study sites and period in Guinea were used, producing a less reliable estimate of chimpanzee population size for the area. During the 2016 survey, a nest degradation rate study was completed for this area and thus the estimation is more reliable.

It is to be noted that there is high variation between the two survey periods, which was explained in the report as due to difference in rainfall pattern (which in turn would influence the nest degradation rate), but other factors have not been considered, such as inter-observer reliability. Different teams were used to conduct the surveys (two teams in 2014 and four teams in 2016) however no inter-observer reliability study was conducted to ensure that the teams were well calibrated and that there was no difference in the nest detection rate between the different teams. Since no inter-observer study was conducted prior to conducting the surveys, to assess if this introduced a bias in the data, a comparison of the nest detection rate (the detection function curve) between teams could be conducted and if a difference was observed, then the data could be stratified according to the teams (including different detection rate for each team). Although this is important to conduct before data are used for detailed planning, our analysis did not find any indication of significant variation in encounter rates between teams which suggests that the data is sufficient to use for offset planning.

Table 33: Review of WCF survey data according to general best-practice standards in ape survey method

		Review of WCF data	
Aspect of survey	**Key requirements of the line transect method**	**Observation**	**Assumption met?**
Survey design & effort	The number and length of sampling units should be based on preliminary data on encounter rates for the study area; At least 30 sampling units are required to minimise inter-transect variation; The survey design should ensure a sufficient coverage of the study area; and	A systematic survey design was used that included the entire survey area in 2014. The survey design used for 2014 and 2016 were different, maintaining the same transect length, but adopting different spacing in different areas and excluding areas that were surveyed in 2014 (including the classified forests).	Yes

Aspect of survey	Key requirements of the line transect method	Review of WCF data	
		Observation	Assumption met?
	A minimum of 60 observations would be required to estimate population abundance.	The survey effort was sufficient: c.200 sampling units were surveyed that include more than c.3,000 nest observations.	
Line transect method	The five key requirements for line transects are: • Observations close to or on the line are detected with certainty; • Observations are recorded at their initial location; • Distances are measured accurately; and • Conversion factors are site-specific. • If multiple observers are used, potential inter-observer bias in detection probability is controlled for.	Perpendicular distances to the nest observations were measured precisely according to the raw data provided. A histogram of the data also showed that nest observations close to or on the line were detected. A nest degradation rate was estimated for 2016, but not in 2014. A nest production rate from another site was used to estimate population size (although not ideal, this is standard practice due to the difficulty of obtaining such data). Inter-observer bias was not specifically controlled for and there is no comparison of detection functions between teams.	Mostly
Precision of results	Best practice for ape surveys is that the coefficient of variation should be less than 30% to ensure reliable precision of the estimate.	The coefficient of variation was c.11% for the population size estimate made by combining data from 2014 and 2016, which reflects a good precision of the estimate.	Yes

Mapping of chimpanzee data

The WCF report presents maps of chimpanzee density. These maps are interpolations of the line transect data and do not take account of habitat distribution, altitude or other variables influencing chimpanzee distribution. These maps are therefore visualisations of the underlying data and do not necessarily closely resemble the actual distribution of chimpanzee density. While they can be appropriate for identifying large-scale patterns (e.g., the reduced chimpanzee encounter rate in the west of the 2014 study area), they are not appropriate for assessing chimpanzee distribution at spatial scales smaller than several times the inter-transect spacing, as would be required for protected area delimitation for example.

Suitability of the data for offset planning

Overall, best practices were followed and we found no reason to doubt the chimpanzee population estimates provided by WCF. We therefore consider them to be a reasonable and appropriate basis for evaluating offset feasibility.

The existing data also serve as an excellent basis for future conservation planning though a number of refinements to the analysis would help improve their usefulness:

1. An assessment of **inter-observer reliability** should be conducted (as above)
2. A **habitat suitability model** could be developed. As highlighted in the WCF results, different factors may influence the presence of chimpanzees in different areas of the proposed protected area. It would be useful to conduct a more detailed analysis to understand actual and potential chimpanzee distribution before determining the limits of the protected area. For example, the importance of different factors (e.g. distance to water, forest cover, altitude) could be tested based on the results of the surveys, and then these variables can be included in a habitat suitability model that would provide a much more representative assessment of chimpanzee distribution.
3. A more detailed assessment of **the importance of the current classified forests**: The existing classified forests were highlighted as important for the chimpanzees, however no statistical comparison was made between classified forests and non-protected areas to understand their significance. Furthermore no transects were conducted in the classified forests during the 2016 survey.