WCS AND TAKAMANDA-MONE, CAMEROON
A REDD+ FEASIBILITY ASSESSMENT

PROJECT DESCRIPTION

The long-term goal of the Takamanda-Mone REDD+ project is to contribute to the national REDD+ readiness preparation in Cameroon through the enhancement of forest resources conservation, biodiversity protection and sustainable rural development in the Takamanda-Mone Landscape. The study examines current and future threats and the potential implementation of different types of emissions reduction activities (such as improved forest management, avoided planned and unplanned deforestation, etc.), as well as reforestation when appropriate (in the form of forest plantations, agroforestry, etc.) in a spatially coherent way that takes full account of local development needs. The goal of the feasibility assessment is to provide the main stakeholders in the landscape with more detailed information about the current drivers and underlying causes of deforestation and forest degradation, and to evaluate options for different land uses including REDD+ activities that contribute to local development, biodiversity conservation, and climate change mitigation.

PROJECT LOCATION: CAMEROON

Project Area: 3,256 km^2 (Cameroon side)

The 12,000 km^2 Takamanda-Mone Landscape straddles the border of Cameroon and Nigeria and encompasses an important array of biological and cultural diversity. On the Cameroon side, the 4,300km^2 Takamanda-Mone Technical Operations Unit (TOU) consists of different land-use zones, including the recently created Takamanda National Park, the Mone River Forest Reserve currently set aside for future productive forestry, the remote Mbulu montane forest highlands, several active forest concessions, and different zones of increasingly rapid agricultural expansion. Emblematic of the Gulf of Guinea, the Takamanda-Mone Landscape is an area of high biodiversity with important large mammal species found in the forests of this region including the world's most endangered species of gorilla, the Cross River gorilla (*Gorilla gorilla diehli*).
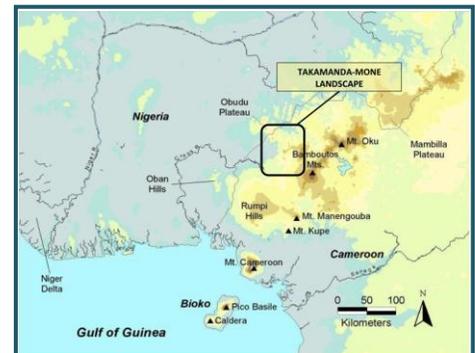
Figure 1. Location of Takamanda Mone landscape in the region
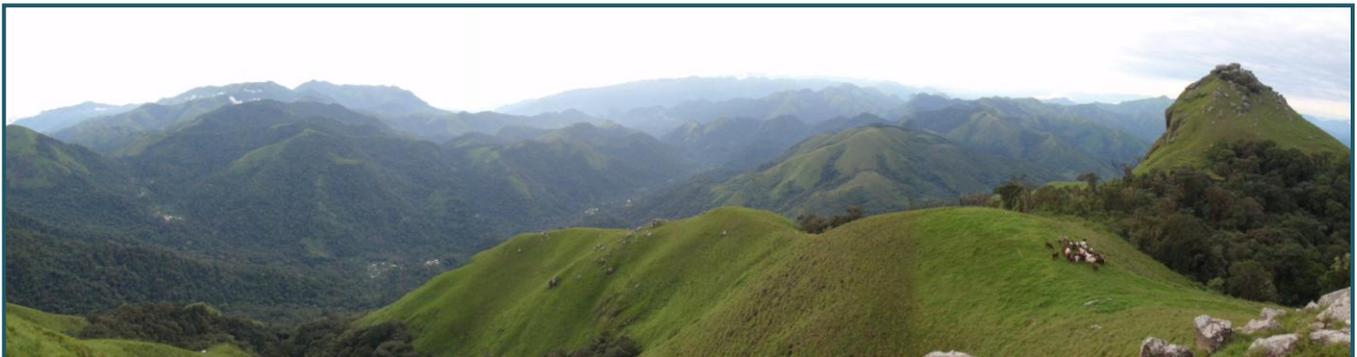
Panoramic view of the Kagwene Gorilla Sanctuary, Cameroon. *Credit: Aaron Nicholas, Wildlife Conservation Society*

DEFORESTATION THREATS

Current drivers of deforestation and degradation:

- **Small-scale agriculture**: The main driver of deforestation is currently small-scale agricultural production for subsistence consumption and to a limited extent for commercial crops (cocoa especially) occurring around villages. Forest conversion rates seem to be very low, mainly due to low population densities and difficult or inexistent market access. The expansion of areas of slash-and-burn subsistence agriculture is limited due to poor soil quality and there are few incentives for commercial agricultural production.

- **Commercial legal logging**: Commercial logging is ongoing in several concessions in the landscape, mainly in the south. The main company TRC is engaged in a process towards certification and appears to be implementing some Reduced Impact Logging (RIL) practices already. They are in a position to quantify the improvements in impact on the managed forest compared to their own previous operational practices.

- **Illegal Logging:** Degradation from illegal logging seems to occur just across the landscape, particularly in proximity to rivers. It is especially prevalent outside Takamanda National Park. The trend seems to be an increase in the occurrence of illegal logging, also driven by demand from close-by Nigeria where little exploitable timber volume remains. Illegal removals also seem to occur in the Mone River Forest and the impact on commercially valuable timber species may be significant. Local officials of the forestry administration but also village chiefs are implicated in allowing access and granting impunity to loggers who usually come from outside the area. An important factor is the absence of any formal management of the forest area (in practical terms even within Mone River Forest Reserve) either for formal organized logging or conservation.

Illegal logging poses a threat to more accessible areas of CRG habitat and is fueled by a lucrative domestic and trans-boundary trade in illegally felled wood. *Credit: WCS Cameroon*

- **Fuelwood:** Residents use woodfuels; however, the impact on forests seems to be negligible because much of the wood stems from previously cleared slash-and-burn agricultural areas and because population densities are low. There appears to be no charcoal production and no significant export of any woodfuels from the zone, at present.

Threats for increased deforestation and degradation:

- **Road construction and improvements:** A small road in very poor condition that links Mamfe in the south and Akwaya in the north is slated for improvements and upgrade to a secondary (non-paved) road. This appears to be a firm plan and some infrastructure has been put in place over the last years already (e.g. bridge pillars, surface improvements in the southern section). The road has recently been financed; however, the planning status seems unclear. The Ministry of Public Works has planned to link Bamenda to Akwaya first before completing Akwaya-Mamfe. The completion of this road upgrade would presumably trigger an expansion of small-scale commercial agriculture (different production patterns already exist compared to areas in the vicinity that do not have road access). Depending on market conditions, main crops could be cocoa, fruit trees, and possibly oil palm. Avoided unplanned deforestation along the Mamfe-Akwaya road is thus one of the most viable scenarios for the feasibility study and will be modeled.

WCS has a core team of expert CRG trackers who assist with monitoring and research work. *Credit: Aaron Nicholas, Wildlife Conservation Society*

- **Extension of Logging Concessions**: There are ongoing discussions to give out concession areas within Mone River Forest Reserve (in accordance with its legal designation as a permanent production forest). This area has been identified as critically important habitat for Cross River gorillas and other biodiversity in the region. Options for Improved Forest Management, set asides, and community forestry will be evaluated in the feasibility study.

- **Mining**: Although quantified data is lacking, current artisanal mining activities seems to have a negligible impact on forest cover at present. However, there is a potential for future mining efforts in the area. The company Soft Rock has been granted an exploration permit, although it is unclear which area exactly is covered by this and what types of minerals are hoped for. However, this is not a likely REDD+ scenario given that the timeline and area of any activities are unknown, finding documentable evidence of a concrete threat is not possible at present, and it is more than questionable that any REDD+ project could generate economically attractive alternative revenues in case of confirmed finds of precious minerals or metals**.**

- **Commercial agriculture:** A proposal and preliminary planning permit (with dubious origins) exists for a large-scale oil palm project south of the landscape. This would concern a maximum of 80,000 ha, although this number is not based on an in-depth analysis of available land areas and economic potential. Currently, there are no known plans or ongoing discussions for similar large-scale commercial agricultural projects in the Takamanda-Mone Landscape itself.

FOREST BENEFITS

Climate

In the broader landscape of Takamanda-Mone the vegetation consists in a mosaic of lowland and mid-altitude forests. These forests are mostly biafraean characterized by abundance of Caesalpineaceae trees and littoral antlantic forest dominated by several big trees like *Lophira alata* (Ochnaceae), *Saccoglotis gabunensis* (Humeriaceae) and *Cynometra hankei* (Caesalpineaceae).Current deforestation rates in the landscape seem to be relatively low, mainly due to very limited access on the Cameroonian side. As it is improved, pressures on the forest resources, mainly through rapid expansion of slash and burn agriculture, grassland burning and illegal exploitation of timber and non-timber forest products, will likely increase.

Magnificent forest tree. Cross River gorillas are found in lowland, mid-elevation and montane forest habitats. If threat in lowland areas could be reduced (especially hunting), there is no reason why they could not extend their presence once more into this habitat. *Credit: Aaron Nicholas, Wildlife Conservation Society.*

Our initial land use change analysis indicates that annual deforestation rates increased from 0.08% between 1986 and 2000 to 0.25% from 2000 to 2008 in the Cameroonian part of the landscape and from 0.11% to 0.43% for the same periods in the wider reference area. Conservative estimate of the carbon stocked in the biomass is 135 tons per hectare and about 25 tC after conversion to crop land; hence, the estimated emissions for each hectare of cleared forest is 400tons of CO_2-e. Assuming a 0.4% annual deforestation rate, we estimate that approximately 1,300 ha will be lost per year, resulting in annual GHG emissions of over 500,000 t of CO_2-equivalents.

We are currently attempting to conduct similar estimations for emissions from logging activities. The GAF study conducted in similar forests shows a mean carbon stock reduction from logging damages of 1.3 tC per m^3 of extracted roundwood in the certified Palisco concession and 2 tC/m^3 in the non certified SCBT concession. Comparison of overall emissions from road construction in certified and non certified concessions was not conclusive. However, this data along with data from a current WCS study in Gabon will be used to calculate emissions from forest harvesting and reduction potential of RIL and other IFM measures.

Biodiversity

The Takamanda-Mone is an area of high biodiversity with 25 large mammal species found in the forests many of which have a high level of threat, including the Nigeria-Cameroon chimpanzee (*Pan troglodytes ellioti*), the drill (*Mandrillus leucophaeus*), forest elephant (*Loxodonta african cyclotis*), leopard (*Panthera pardus*), Preuss's monkey (*Cercopithecus preussi*) and the world's most endangered species of gorilla. Fewer than 250 individuals remain of this elusive Cross River gorilla (*Gorilla gorilla diehli*). Biodiversity amongst other taxa is equally high, the region has some of the highest levels of plant diversity in Africa and forest cover remains largely intact across the landscape.
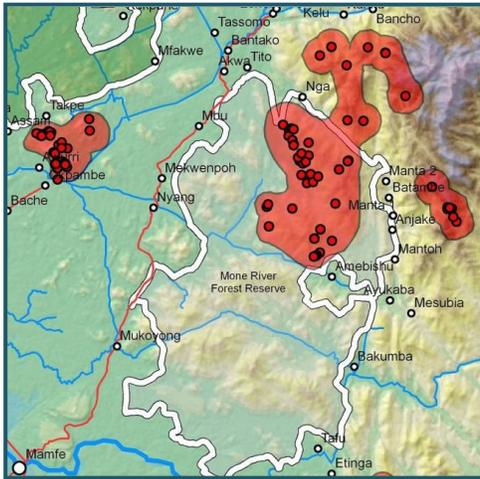
Nyango (above) is the only captive CRG. She lives in the Limbe Wildlife Centre and provides a rare opportunity to come face to face with one of these most elusive gorillas. *Credit: Nicky Lankester, Limbe Wildlife Centre*

Figure 2. Maps of distribution of Cross River gorilla population within Mone forest.

Interestingly, recent surveys show that although under heavy hunting pressure and gazetted for logging, the Mone River Forest Reserve harbors a greater number of species than the adjacent Takamanda National Park including ten possible new plant species to science and the possibility of a new species of hairy frog. In particular, it has been identified as a key area for the protection of the Cross River gorilla, which initially was believed to persist only in a small area in the north of the reserve. Since then genetic and field surveys have revealed that Mone is a hub in a network of unprotected gorilla sites to the east and north, due to its centrality, wide distribution and connectivity with adjacent forests with Cross River gorilla populations (see Figure 2). The 2007 Action Plan for the Conservation of the Gross River gorilla lists Mone as one of the most important of the 12 or so known Cross River gorilla sites.

Commercial bush-meat hunting is pervasive and is leading to local extinctions in many forest areas. Some animals, notably the great apes, are still-hunted for traditional and medicinal reasons. For example, chimpanzee bones are valued for mending broken bones and sprains and snakes are associated with such as the bile and fats of the python (*Python sabae*) which are used to treat rheumatism.

Community

The Takamanda-Mone and Mbulu area has an estimated population of about 16 000 inhabitants (12000 living in 31 villages in and around Takamanda National Park, and approximately 3,200 inhabitants around Takamanda and Mbulu area) with close to 50% or more falling within the demographic grouping of 0 to 20 years (Asaha, 2005 ; KfW, 2006). This estimation is now probably out of date and will be revised using the 2005 national census estimation per village to calculate whether the population growth is 4 % per annum as announced. Considering the high immigration rate coming from the North West region and the neighboring Nigeria, the demographic projections show that the populations will approximately double by the year 2025 putting the area under immense pressure to ensure food security. The population is comprised of a mixed ethnic composition as a result of continued migration. This includes the Anyang people of the Takamanda area, the Ajoh who occupy the land around Mone with the Kissam, Batieku and Menka.

The infrastructure in the Takamanda-Mone area is far below national average. The area is accessible via a seasonal road. During the rainy season vehicles cannot pass the Mone River at Nyang due to lack of a bridge
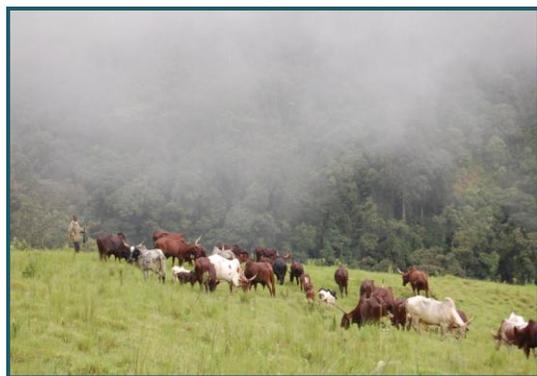
Cattle grazing poses a threat to montane CRG habitat- grazers set fires in the dry season to stimulate new growth, but these fires also spread into and destroy adjacent forest. *Credit Aaron Nicholas, Wildlife Conservation Society*

over this river. The road which presently terminates at about 3km after Bachama is only accessible by four-wheel drive vehicles or motor bike. Currently, most of the villages inside this area do not have access roads and are only accessible by foot. Populations have no access to safe drinking water, health care and/or sufficient education. This remoteness also limits income opportunities from agricultural products, due to high transportation costs and force youth to leave their villages for town in search of small jobs opportunities. Most of the remote communities rely on the local natural resources (hunting and gathering) as their main source of income. A rough comparison illustrates that farm products such as palm oil yield an average annual income of about 85,655 CFA per household, whereas, an average of about 18,470 CFA is obtained from forest products. The paving of the road will have profound impact on the livelihoods of the population.

FEASIBILITY ASSESSMENT

Based on our initial analysis of these threats, we have chosen to focus on the **three most plausible scenarios** for baseline creation:

1. **Avoided unplanned deforestation along roads:** Deforestation due to agricultural conversion (by resident farmers and/or new settlers) may be expected to strongly increase in the wake of an improvement or upgrade of the road that cuts N-S between Takamanda NP and Mone River Forest Reserve linking Mamfe in the south and Akwaya. We will model this change based on changes along reference roads after similar upgrades.

2. **Avoided planned degradation from improved forest management:** We will evaluate prospective degradation caused by formal commercial logging within Mone River Forest Reserve (and possibly the wider landscape) resulting from newly allocated concessions. To do so, we hope to work with TRC to better understand impacts of different RIL techniques. Further, we will model different land use options within the Mone area, including evaluating bigger set asides based on gorilla data and potential for community forest management.

3. **Avoided degradation from illegal logging:** Illegal logging is a transboundary problem, in which information concerning the extent and agents is still unclear. Nonetheless, it is a plausible scenario due to continuation or increase of degradation caused by illegal informal timber exploitation across the landscape, in particular in proximity to rivers (and roads).

As part of the next steps in our analysis, we will:

*   Build REDD capacity and outreach among national and regional government departments, local communities and other stakeholders.
*   Collect existing data on carbon stocks in different land-use types and under different types of management (managed vs. unmanaged production forest, protected forest, plantations, agriculture, etc.).
*   Quantify and map historic rates of change of land-use through improved remote sensing and extensive ground-truthing, in order to estimate future emissions without project interventions (BaU scenario).
*   Compile baseline data, including drivers of deforestation, and socio-economic and biodiversity surveys in order to develop different scenarios for land use, management modalities and emission reduction activities in the Takamanda-Mone TOU (see table 1).
*   Evaluate potential impacts (biodiversity protection, livelihoods, etc.), costs (implementation, opportunity), benefits (emission reductions and others) and feasibility (political, social, financial) under different future land use scenarios in the Takamanda-Mone TOU and in the wider Takamanda-Mone Landscape.
*   Evaluate potential flows of funds to local communities and local / regional / national authorities in different land-use types under different types of management, including opportunity costs and upfront funds required.

Panoramic view of the Kagwene Gorilla Sanctuary, Cameroon. *Credit: Aaron Nicholas, Wildlife Conservation Society*

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We do so through science, global conservation, education and the management of the world's largest system of urban wildlife parks, led by the flagship Bronx Zoo. Together these activities change attitudes towards nature and help people imagine wildlife and humans living in harmony. WCS is committed to this mission because it is essential to the integrity of life on Earth.