Extractive Resource Zone Planning in Central Africa: A U.S. Forest Service Guide

Version 1.0

Contents:

Definitions:

CARPE implementing partners - Institutions that have been awarded USAID funding to implement the CARPE program.

Desired Conditions – The broad vision for an area over an extended period of time. Set idealized goals for what the area should be, what it should protect, and who it should benefit.

Evaluation –Analysis of information (including monitoring results) to determine whether or not management (including plans) of the landscape/macro-zone needs to change.

Guidelines – Set of general rules that indicate what uses and activities are permitted or prohibited in a given area. Guidelines also indicate certain conditions that should be met for a certain use or activity to proceed.

Land Use Plan - A plan that determines the stratification of land uses within a landscape, and provides basic guidance for the each land use zone and the integration of these zones.

Management Plan: A plan usually developed and administered by a single entity for the management of a single area in a land use zone.

Monitoring – Systematic process of collecting information to evaluate progress toward meeting desired conditions or plan objectives and other key trends in the planning area.

Objectives – Specific accomplishments that indicate measurable progress toward achieving or maintaining the desired conditions. Identify objectives for accomplishment in an area for a specific timeframe.

Planning – Process in which stakeholders (community members, scientists, government representatives, private businesses, traditional authorities, etc.) come together to discuss and determine how to manage resources in a particular geographic area for the benefit of current and future generations.

Stakeholder – Individual or group that may be affected by the management of an area or that may have an interest in its management, even if they are not directly impacted by activities in the area.

Workplan – Annual plan of projects or activities, including the identification of necessary human and financial resources.

Zoning – Process of identifying (or delineating) geographic areas separated by differing land uses (and associated guidelines) as a part of a broader land use planning process.

1.0 INTRODUCTION

This document provides practical guidance for the implementing partners of the United States Agency for International Development (USAID) / Central African Regional Program for the Environment (CARPE) to engage in developing and implementing land use plans for Extractive Resource Zones (ERZ) within the Congo Basin Forest Partnership (CBFP) Landscapes. ERZs include forest concessions, large-scale private plantations, mining, oil and gas, safari hunting zones, and other energy infrastructure.

The landscape land use planning framework promoted by CARPE prioritizes three types of zones (macro-zones) within the landscapes: Protected Area (PA), Community-Based Natural Resource Management (CBNRM), and Extractive Resource Zone (ERZ). This guide provides information to CARPE implementing partners to plan their own activities related to managing natural resources in ERZs in the landscapes in partnership with the private-sector concession/title holder, government, and local communities. ERZ planning is fundamentally a multi-stakeholder process best undertaken in the context of an integrated landscape land use plan. *CARPE implementing partners' involvement in the ERZ does not involve any extraction of the resources themselves. but rather uses their comparative advantages to support planning and implementation to promote sustainable natural resource management that maintains ecosystem services and supports community livelihoods*.

USAID/CARPE and its relation to the CBFP

CBFP defined - The Congo Basin Forest Partnership (CBFP) was launched at the 2002 World Summit on Sustainable Development in Johannesburg. As a "Type II" partnership, it represents a voluntary multi-stakeholder initiative contributing to the implementation of an intergovernmental commitment, i.e., the Yaoundé Declaration, and brings together the 10-member states of the Central African Forests Commission (COMIFAC), donor agencies, international organizations, non-governmental organizations (NGO), scientific institutions, and representatives from the private sector. CBFP works closely with the COMIFAC.

CARPE defined - The Central African Regional Program for the Environment (CARPE) is a long-term initiative by the United States Agency for International Development (USAID) to promote sustainable natural resource management in the Congo Basin by supporting increased local, national, and regional natural resource management capacity. CARPE is the core mechanism through which the United States contributes to the CBFP.

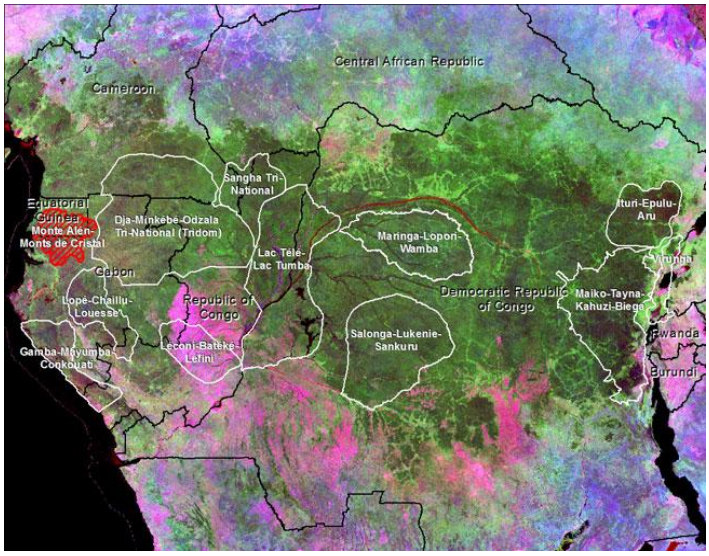
CBFP Landscapes[1]

CARPE currently works within 12 key biodiversity landscapes in seven countries. Several of the CBFP landscapes are transboundary and are recognized by international agreements promoting cooperation on environmental monitoring and law enforcement. These 12 landscapes form the pillar of CARPE's regional conservation strategy and cover an area of 680,300 km².

The CBFP landscapes were identified as appropriate conservation targets at a 2000 Conservation Priority-Setting Workshop for Central Africa. The workshop was organized by the World Wildlife Fund and

[1] http://carpe.umd.edu/Plone/where-carpe-works/landscapes
WWF. 2003. Biological Priorities for Conservation in the Guinean-Congolian Forest and Freshwater Region. WWF-US/CARPO,Washington, DC.

brought together over 160 biologists and socio-economic experts to carry out a region-wide evaluation and resulted in the drafting of A Vision for Biodiversity Conservation in Central Africa (WWF 2003).The 12 landscapes were recognized as priority areas for conservation based on their relative taxonomic importance, their overall integrity, and the resilience of ecological processes represented.



"In 2000 the Vision for Biodiversity Conservation in Central Africa was adopted by the country signatories of the Yaoundé Declaration as the blueprint for conservation in the region. The Yaoundé Declaration significantly evolved six years later into the signing of Africa's first ever region-wide conservation treaty, a historic milestone for the future of the world's second largest rainforest. Additionally, the Brazzaville Priority Action Plan, which outlines targets for the period 2002-2005, and the subsequent Convergence Plan for the period 2005-2007 focused implementation on transborder forest areas identified within the biodiversity vision. (WWF 2003)"

In accordance with principles of integrated conservation initiatives and broad-scale land management, each landscape is divided into different categories of management areas, including: protected areas, community-based natural resource management zones, and extractive zones. Within these zones, CARPE and its partners are working to implement sustainable natural resource management practices at the local scale.

This ERZ guide is the fourth in a series of land use planning guides developed by the U.S. Forest Service (USFS) for USAID/CARPE and its partners, including an overarching, integrated landscape guide, as well as guides for each of the macro-zones. In these planning guides, the USFS shares its expertise in managing large forested multiple-use landscapes in the United States. USFS guidance is tailored to the specific context of Central Africa and the needs of implementing partners and African government agencies. This adaptation of lessons learned and processes utilized in the United States to a Central African context is a result of partnerships and direct technical assistance provided by the USFS International Programs (IP) office. Both CARPE implementing partners and host country government agencies charged with managing these resources should benefit from these guides.

1.1 Purpose of Extractive Zone Planning

The purpose of planning is to develop management and governance strategies that respond to scientific understanding of natural and social systems, as well as changing societal conditions and values. Effective planning is a process that promotes decisions that are informed, understood, accepted, and implementable.

The purpose of an ERZ management plan is to describe how resources will be extracted on a sustainable basis that does not compromise the long-term productivity or ecological values of the

land. It takes into consideration the title holders' aspirations and other stakeholders' concerns, as well as the pertinent legal/regulatory framework, for a given area over a stated period of time. ERZ management plans describe desired conditions for land and resources, their function and use, and their sustainability for future generations.

1.2 Extractive Zones in a Broader Landscape Context

Land management decisions are ultimately political. Nonetheless, such decisions can be greatly influenced by a technical process focused on balancing tradeoffs between the often opposing goals of conservation and development. Landscape-level planning is intended to identify tradeoffs by bringing diverse interests to the table to work out the long-term vision leading to mutually beneficial agreement on the landscape's desired conditions and objectives. Development of a common vision and high-level objectives then orients, through work planning exercises, actions that are needed in each of the landscape's macro-zones. Specific activities on the ground are based on priorities and "sideboards" described in a management plan for either the landscape or the macro-zone.

Purpose of Landscape Planning

Outline and implement landscape planning processes to:

1) maintain long-term ecosystem functions of the forest and biodiversity present within these landscapes;
2) continue the supply of products and income for local communities that depend upon these landscapes;
3) ensure extraction areas in landscapes do not negatively influence local populations or ecosystem health, while contributing to the country's economy; and
4) strengthen in-country natural resource management capacity.

ERZ planning in a Landscape Context

Along with planning for PAs and CBNRMs, ERZ planning falls under, and must be consistent with, the integrated landscape land use plan. Landscape land use planning is an integrated process composed of discrete parts (overarching landscape plan, macro-zone plans, annual workplans) joined to form a rational, logical management approach (see the USFS Guide to Integrated Landscape Land Use Planning in Central Africa – http://carpe.umd.edu/Plone/resources/carpemgmttools).

Macro-zone plans, such as the ERZ plan, link directly to the overall landscape plan and must articulate how they reflect, support, and will contribute to the landscape's desired conditions and objectives, as well as how they will address site-specific issues and needs. The objectives of the three macro-zones of a CARPE Landscape therefore, should be harmonized, and should not conflict, with the objectives of the overall landscape.

Moreover, these planning guides are fundamentally guides for adaptive management. They are considered dynamic and "living" documents that will benefit from further technical assistance missions and other feedback from CARPE implementing partners.

1.3 The Role of CARPE Implementing Partners in ERZ Planning

The CARPE program works closely with its partners to improve Central African natural resource management capacities, contributing to global, national, and regional objectives. Field efforts concentrate on 12 landscapes, chosen and delineated across the Congo Basin as CBFP/CARPE areas of focus due to their particular importance and unique value to forest and biodiversity conservation.

Not all formal extractive resource zones, protected areas, or community lands will necessarily be targeted immediately for ERZ, PA, and CBNRM planning and management actions in the landscape. The landscape plan should identify through site-specific decision criteria where, what processes, as well as what implementation activities, need to be addressed first. See figure 1 for an example of macro-zoning in a landscape resulting from this prioritization exercise.

In prioritized ERZs, CARPE implementing partners engage stakeholders to appropriately plan and manage an ERZ so that extraction operations, other activities, and any type of concession management plan appropriately promote long-term sustainability of the ERZ—economically, ecologically, and socially. CARPE implementing partners have no legal authority to control how an ERZ is managed. Therefore, influencing management in an ERZ will largely depend on working constructively with the concessionaire, local communities, and the government authority throughout the process.

Constructive Engagement Based on Institutional Comparative Advantages

CARPE partners, based on their comparative advantages, provide technical assistance in wildlife management and social/community engagement to the concessionaire and pertinent land-management authorities. Other areas of CARPE partner intervention in ERZs include:

1) identification of key/sensitive zones for conservation/protection;
2) promotion of certification or other tools for sustainable forest management and/or minimizing negative impacts of mining or other extractive activities;
3) contributing to monitoring and evaluation of the environmental and social impacts of extractive activities;
4) development of bushmeat management plans and training concessionaire and government staff on developing and implementing these plans;
5) technical assistance for improving forest management; and
6) elaboration of participatory community development plans using resource extraction revenues to improve community livelihoods and promote community participation in sustainable resource management.

This ERZ planning guide addresses what CARPE implementing partners should seek in an ERZ to strive toward sustainable and socially and ecologically responsible operations. Therefore, this document is intended to guide CARPE implementing partners in planning their natural resource management activities in ERZs to adhere to and promote landscape plan objectives.

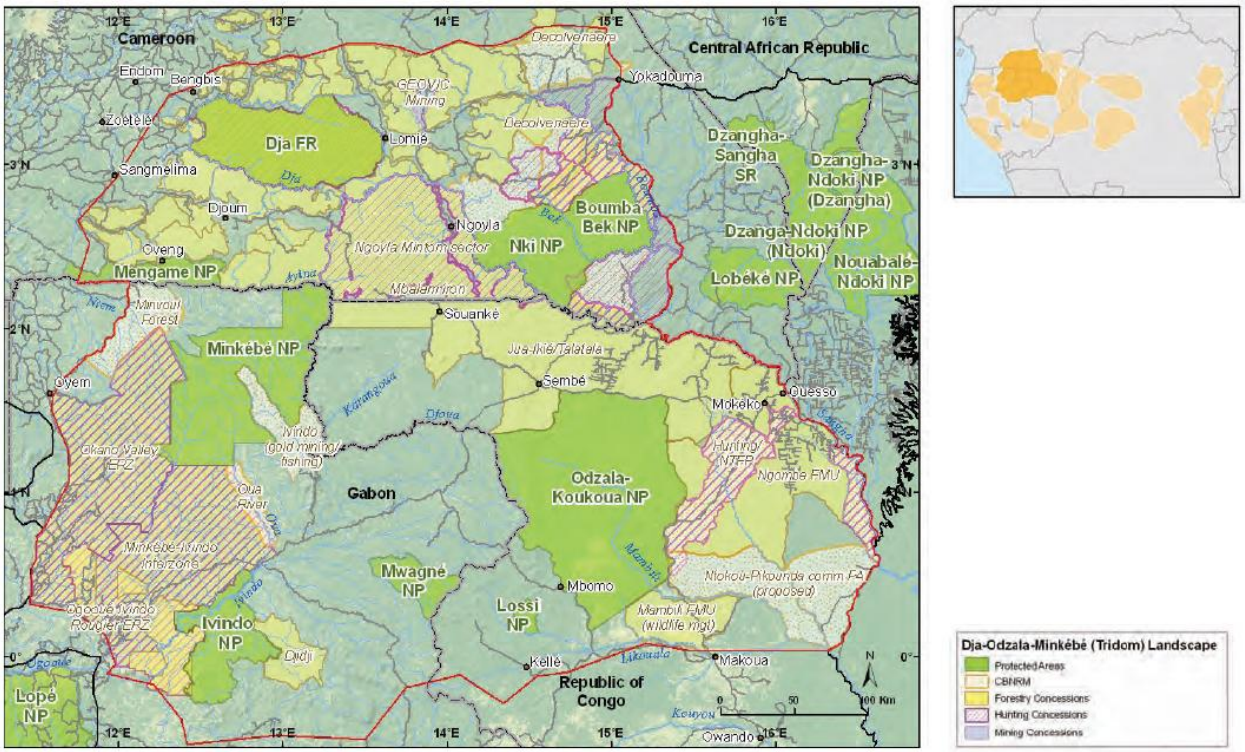


Figure 1. Example Macro-zones in the Dja-Odzala-Minkébé (Tridom) Landscape [2]

This ERZ guide informs CARPE implementing partners about how to engage concessionaires in developing and implementing formal management plans or complementary plans that will ultimately be used by the concessionaire, communities, and government for sound management. In addition, the ERZ guide outlines minimum standards expected of CARPE implementing partners. The USAID/CARPE management team uses these standards to assess implementing partners' progress in developing ERZ management plans. These minimum standards are highlighted under each section as "Tasks" that need to be completed throughout the process.

Chapter 2 outlines key concepts central to ERZ planning. Chapter 3 describes the process for developing an ERZ plan in the CBFP/CARPE context. Chapter 4 summarizes the general format and contents of the formal management plans required under various national laws and regulations in the Congo Basin, including specific elements for CARPE partner intervention.

[2] The Forests of the Congo Basin - State of the Forest 2008, Editors : de Wasseige C., Devers D., de Marcken P., Eba'a Atyi R., Nasi R. and Mayaux Ph., 2009, Luxembourg: Publications Office of the European Union, ISBN 978-92-79-13210-0, doi: 10.2788/32259 USAID/CARPE website - http://carpe.umd.edu/

2.0 EXTRACTIVE ZONE PLANNING CONCEPTS

2.1 Concepts Common to all Extractive Zones

2.1a General Extractive Resource Zones Concepts

An ERZ can be identified for specific lands or groups of concessions with similar management objectives. There is no single best way to manage tropical forests, so adapt management to fit local conditions and to meet local or regional objectives.

Management Plans

All Central African countries require that resource extraction activities be sanctioned by some form of management plan with subsequent social agreement contract (see section 3.0 for description of the process). Laws, regulations, and actual practice vary, however, as to whether an approved plan is required prior to initiating resource extraction. Generally, a concession holder can begin extraction during a provisional period, while the management plan is developed. Ensuring that the plans are developed and implemented following the law and best management practices is a key opportunity to move toward sustainable forest and wildlife conservation and needed rural development.

Best Management Practices

Responsible resource extraction can protect important habitat components. Minimum standards and guidelines for resource extraction plans should include most or all of the following:

- low-impact road construction and access
- special provisions for mining and harvesting timber in or near streams or other water bodies
- protection of locally important or rare habitats
- for logging operations, provisions for tree extraction on slopes, such as the use of cables and wenches to pull felled trees to skid trail locations
- tree felling and extraction procedures for other conditions
- inventory and monitoring requirements
- placement of logging or mining camps and landings
- feeding concession workers and their families living in the concession, in particular providing protein sources other than bushmeat
- access of indigenous and other local populations to the forest for hunting, gathering and other resource use
- including local populations in natural resource planning
- reducing impacts on wildlife and other non-forest products

Local Communities

Forests provide goods and services, as well as jobs that are critical to the livelihoods of millions of people living in rural and urban areas of the Congo Basin. For example, many people rely on timber and non-timber forest products, supplies of wildlife for protein, as well as the benefits of water and soil protection, just to name a few. ERZs frequently overlap with local communities' traditional resource use areas. Therefore, involving local populations in managing ERZs and

maintaining their access to natural resources should be priorities for industry and governments alike.[3]

Effects of ERZ Activities

ERZ activities have many cumulative, direct, and indirect effects on the environment. Tree removal, forest clearing, complete removal of vegetation, soil erosion, reduced water quality, and reduced abundance and distribution of wildlife (including both protected and more common species) are typical effects of ERZ activities. In Congo Basin forests, biodiversity is most impacted by indirect effects of activities associated with timber, mining, and other extractive operations. Road development increases access to remote forests. If uncontrolled, new access frequently leads to expanding agriculture and human settlement, illegal logging, mining, and bushmeat hunting. There is often a lack of effective protection for streams and other water bodies.

ERZ activities such as the removal of trees or broader deforestation and land-use conversion for a mine or mono-crop plantation can also directly affect biodiversity and the health and livelihoods of local human populations.

Effects Analysis

The Cumulative Effect on the environment results from the incremental impact of the ERZ activity when added to other past, present, and reasonably foreseeable future activities, regardless of what company, governmental agency, or person undertakes such activities. Cumulative effects or impacts can result from individually minor, but collectively significant actions taking place over a period of time.

Direct Effects are caused by the ERZ activity and occur at the same time and place.

Indirect Effects are caused by the ERZ activity and are later in time or farther removed in distance, but still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects.

Protecting Key Habitats

Protecting sensitive sites, such as wetlands, riparian areas, and steep slopes is important to consider because retaining key habitat features can speed recovery of impacted landscapes. If an ERZ contains key species (i.e., threatened, endangered, or endemic species) or their habitat, blocks of that habitat may be left intact to serve as refuges for the species. Consider connectivity among these patches and any protected areas in the landscape when planning extractive operations.

Barriers to Conservation

Many legal, policy, technical, financial, and cultural barriers may limit forest and biodiversity conservation outcomes of efforts to sustainably manage resource extraction:

[3] Chemonics. 2008. *Partnering with Extractive Industries for the Conservation of Biodiversity in Africa: A Guide for USAID Engagement. Biodiversity Analysis and Technical Support for USAID/Africa (BATS)*. Washington DC. http://www.frameweb.org/adl/en-US/2910/file/359/BATS_EI_Guidebook_FINAL.pdf

- short length of concession contracts
- lack of regulations specifying how to implement the intent of high-level forestry and environmental laws on the ground
- lack of trained personnel (concessionaires, national/local governments, NGOs)
- remote location of many extractive resource concessions
- lack of enforcement of laws, policies, conditions, and contracts
- lack of land use planning capacity and experience (concessionaires, national/local governments and government agencies, partners)
- lack of local community involvement
- costs of training and capacity building
- corruption in bidding, awarding, and monitoring concession contracts

Governance and Capacity Challenges in Extractive Resource Zones

Government forest sector-related systems, frameworks, and/or institutions are often nonexistent or ineffective:

- The legal/regulatory framework in several countries is incomplete because many of the detailed implementing regulations (*décrets*, *arrêtés*, etc.) and/or handbooks/manuals are either nonexistent or exist in draft form only.
- The judicial system is described as unable to enforce forest/mining/wildlife laws (e.g., judges are uninformed about forest/wildlife laws, and there are insufficient prison facilities and resources, etc.).
- Insufficiency of inter-ministerial collaboration and information sharing, leading to actions being uncoordinated or not communicated appropriately among government agencies (e.g., exploration mining permits being attributed in forest concessions without notice to any local actors—government, NGO, community, logging company).
- In many cases, multi-level, multi-departmental governmental reviews delay communities' participation in natural resource management activities.
- Lack of respect and or application of international conventions/treaties such as CITES.

An overarching recommendation is for governments to finalize and promulgate the implementing regulations. Government authorities (executive and parliamentary) should complete the set of remaining, detailed implementing regulations (*décrets*, *arrêtés*, etc.) and/or handbooks/manuals related to the forest sector. NGOs and the international community may be able to support or assist in this work.

2.1b Sustainability of Legally Extracted and Harvested Resources

All renewable natural resources can potentially be extracted, used, and managed in a sustainable manner. Mining is non-renewable, but resources can be extracted in a manner that largely sustains adjacent renewable natural resource conditions. Country governments (national/regional/local) typically issue long-term extraction lease contracts, often 25–30 years, for harvesting and extracting natural resources in Central Africa.

Governments and concessionaires both have obligations to monitor natural resource conditions during the term of concession contracts. Many local, regional, and international NGOs and other development partners have extensive experience in monitoring and evaluating forest conditions, wildlife populations, wildlife habitat conditions, bushmeat harvest and use, and a variety of socio-economic factors that affect natural resource use and sustainability.

2.1c Road Networks and Access

Road construction, maintenance, and access affect forests and wildlife. Creation of extensive road networks provides more access to formerly remote forests. Roads facilitate development and settlement, including agricultural expansion, forest fragmentation, as well as increased bushmeat hunting and transport to markets.[4] If roads are not well planned, and access is not well controlled, adverse impacts on biodiversity can be disastrous.

Road networks are sometimes much larger than needed to efficiently conduct extractive activities, leading to less forest habitat and additional disturbance to wildlife populations. Poor road quality and inadequate drainage leads to extensive soil erosion and stream sedimentation. Effectively planning road networks, including limits on access points into the forest, helps reduce construction and maintenance costs, allows easier control of access, and can substantially reduce negative impacts on biodiversity, while still providing development opportunities for rural communities. This planning should carefully examine the best locations for roads and logging skid trails, and apply mitigations that can reduce sedimentation and soil compaction, and allow for proper drainage.

Primary roads generally should not be constructed adjacent to protected areas because roads facilitate vehicle and foot access to these sensitive areas.[5] When planning roads, also take into account the amount and quality of buffer zones around protected areas and important sites for wildlife.

Locating primary and secondary roads in either open canopy forest or mono-dominant forests, is less harmful to wildlife. In general, using old logging roads is preferable to opening new road networks, provided the old network allows for a small total road system. Close or control with barriers primary and secondary roads that are no longer needed for transporting resources.

2.1d Unauthorized Land and Resource Use

Illegal wildlife hunting, tree felling, and conversion of forest to agriculture is common in Central Africa. Often, such activities are driven by the lack of alternatives and broader poverty. Government enforcement capacity is too limited to effectively stop such poaching and illegal land conversion. Different community-based or co-management approaches are being developed and tested around the world to seek solutions. Regardless, formal extractive concessions are seemingly here to stay and provide an important means to manage natural resources sustainably over the medium to long term, and to meet development goals at both national and local scales.

2.1e Socio-economic Impacts

Extractive resource concessions often generate large changes in local economies, culture, infrastructure use, employment, and human migration patterns. Concession jobs are highly

[4]- Wilkie, D.S., J. G. Sidle, G. C. Boundzanga, P. Auzel, and S. Blake. 2001. Defaunation, not deforestation: Commercial logging and market hunting in northern Congo. In: R. Fimbel, A. Grajal, and J.G. Robinson (eds.), *The Cutting Edge: Conserving Wildlife in Logged Tropical Forests*, pp 375–399. Columbia University Press, New York. - Fa, J.E., S. Seymour, J. Dupain, R. Amin, L. Albrechtsen, and D. Macdonald. 2006. Getting to grips with the magnitude of exploitation: Bushmeat in the Cross-Sanaga river region, Nigeria and Cameroon. *Biological Conservation* 129:497–510.

[5] Wilkie, et al., 2001.

desired for many reasons, and, given the remoteness of many concessions, human migration in search of concession jobs and spin-off service industries is quite common. Moreover, agriculture is often practiced near where the concession workers live and/or where there is now access to land and markets via the newly opened road. In some areas, very high human (including refugee) migration and settlement into concessions has greatly strained health, education, community governance, and law enforcement services, and increased illegal harvest of forest and wildlife resources.

The following section discusses community investments (e.g., school construction, water facilities, etc.) as formalized in the social agreement stipulations to a concession contract (*cahier de charges*), the hiring and management of the concessionaire's employees, education and training of the broader community, and legal access for indigenous and other local populations to use the forest.

Extractive Industry Contributions to Community Development – Social Agreement (*cahier de charge*)

Direct benefits (jobs, improved health care, housing, education, electricity, etc.), as well as indirect benefits (roads, secondary commercial activities and options, social activities, etc.) due to the presence of extractive industries (even over the short term), are well recognized and supported.

That said, historically and in some examples still today, concessionaires have given cash or objects to local communities (elites and otherwise) rather than investing in more sustainable structures, projects, and institutions. Increasingly, governments, companies, and other parties are pushing for formalized agreements between extractive companies and local communities through the social agreements or *cahier de charge.*

Complementary to the taxes that companies pay to the governments, which should be used for national, provincial, and local development projects, implementation of a properly negotiated, transparent, and standard *cahier de charge* can contribute to sustainable development. Such investments are critical, recognizing in many cases, that once a company closes down its operations, so go the direct and indirect benefits.

Hiring/Coordination

Studies indicate that extractive resource companies should hire locally when possible (i.e., skills exist or can be easily imparted) rather than bringing in laborers[6] from other areas because demand for agricultural land and overexploitation of wildlife increase as human populations

[6] - Elkan, P.W., S. W. Elkan, A. Moukassa, R. Malonga, M. Ngangoue, and J. L. D. Smith. 2006. Managing threats from bushmeat hunting in a timber concession in the Republic of Congo. In: W.F. Laurance and C.A. Peres (eds.), *Emerging Threats to Tropical Forests*, pp.393–415. University of Chicago Press, Chicago.
- Poulsen, J.R., C. J. Clark and G. Mavah. 2008. Wildlife management in a logging concession in Northern Congo: Can livelihoods be maintained through sustainable hunting? In: G. Davies and D. Brown (eds.), *Bushmeat and Livelihoods*. Blackwell Publishers, Oxford, UK.

grow.[7] Thus, companies should avoid providing incentives to immigrate into settlements near concessions whenever possible.[8]

Likewise, it has proven useful for companies to identify a staff member as a point person to deal with wildlife and community issues. Such a point person for wildlife issues can be an effective liaison between the company and other stakeholders including local communities, local government authorities, conservation partners, and independent researchers. They can also ensure that the efforts and results of company initiatives to reduce the impact of extractive activities are well-documented and communicated.

Partnerships among extractive industries and local or international conservation and research organizations can be mutually beneficial. Combining the expertise of scientists and extractive industry officials to design and implement appropriate ecological and wildlife monitoring programs has considerably benefitted wildlife.[9] Further, involving self-financed scientists or conservation organizations in monitoring efforts can defray some of the financial and time costs of long-term monitoring. Additional collaboration with scientists and NGOs for expertise and resources useful in forest management and community engagement can be helpful.

Employee "Code of Conduct"

Employee conduct is important to both extractive industry operations and forest and wildlife conservation. Increased hunting pressures typically associated with concessions must be managed and controlled to protect wildlife populations. Illegal hunting pressure can be reduced with a multi-faceted approach,[10] and extractive resource companies can contribute to ecoguard patrols in and around concessions.

Although national laws and best practices permit some managed/regulated hunting in extractive zones, extractive industry companies should actively work to prevent their employees from being directly or indirectly involved in illegal hunting. Companies should not facilitate hunting by providing guns or ammunition, and prohibiting the transport of bushmeat in company vehicles very effectively decreases illegal hunting in and near concessions.[11]

Mobile units can conduct frequent, random, and well-organized patrols to monitor concessions for signs of poaching. Removing and destroying illegal snares has immediate benefits in reduced potential death and injuries to protected species, as well as indiscriminate killing of other species. Incentive programs and formal procedures for reporting infractions by company employees to local government officials can also be helpful.

Establishing company guidelines for professional accountability can deter unlawful behavior by employees. Field supervisors should be responsible for following through on sanctions against concession employees found guilty of unlawful activities or violating company rules.

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[7] - Fa, J.E., D. Currie. and J. Meeuwig. 2003. Bushmeat and food security in the Congo Basin: Linkages between wildlife and people's future. *Environmental Conservation* 30:71–78. - Fa et al., 2006; Poulsen et al., 2008.
[8] - Elkan et al., 2006; Poulsen et al., 2008.
[9] - Elkan et al., 2006; Poulsen et al., 2008.
[10] - Elkan et al., 2006; Poulsen et al., 2008.
[11] - Elkan et al, 2006.

It is of the utmost importance to establish effective communication among ecoguards, government law enforcement bodies, and concession management. Concession and field team supervisors should be briefed regularly on the results of ecoguard patrols.

Training and Education

In addition to mitigating negative impacts of extractive industries on forests and wildlife, concessionaires can implement proactive educational measures in concession camps and local communities to alleviate pressures on forests and wildlife. Many companies provide basic health services to their employees. Extension of vaccination and preventative health programs benefit staff and wildlife in the concessions. In great ape habitats, it is essential for forestry managers to ensure that employees are well-informed about emerging infectious diseases such as Ebola, and that protocols are developed for detecting and reporting any outbreak.

Educational campaigns can be jointly organized and implemented by extractive industries' representatives, government officials from environment and forestry ministries, conservation partners, and others. An educational program could include: review of wildlife laws and of penalties for infractions; review of extractive company rules and regulations; and an overview of protected species, ecology, and conservation needs.

Administrative/State and Customary/Traditional Resource Use and Access

Another key factor in resource use and community governance is the dynamic that frequently occurs between national and local control of land use. ERZ concessions are usually let for national lands and forests, but in areas where national government has little or no presence at the local level, it is common for local governments or tribal elders to illegally grant settlement or farming rights to lands controlled only by the national government. This creates very significant land and resource use conflicts in and around ERZ concessions. To successfully integrate the concession and local populations, local and tribal leaders must be engaged in developing and implementing the concession plan.

Stakeholders active in many ERZs (governments, enterprises, NGOs) increasingly recognize, formally agree to, and support the rights of indigenous peoples and other local communities to use natural resources (Non Timber Forest Products (NTFP) and legal subsistence wildlife hunting) and lands. That said, land tenure inconsistencies (customary versus administrative) and confusion further complicate matters, and become disincentives for long-term community engagement.

Community associations forming within local populations create space for their voice to be officially/formally recognized in matters related to natural resource management use, access, rights, etc. Continued support for these associations is needed to raise basic awareness on the stakes, rights, and options for constructive engagement. In addition, community associations can benefit from targeted technical capacity building to assure that newly formed (and future) associations continue to mature into formal natural resource management governance institutions. This is especially needed to help clarify property rights over natural resources and to build the institutions necessary to regulate forest management practices and for any future

funding distributed to communities through Reduced Emissions from Deforestation and Forest Degradation (REDD) schemes.

2.1f Conservation at the Landscape Level

Knowledge of resource conditions at both local and landscape levels is vital to support decision making and prepare management plans at all levels. This is particularly important for the conservation of protected wildlife species, as well as for species with large home ranges (e.g., elephant, forest buffalo, etc.).

It is important to consider management of not only concession lands and any adjacent "protected areas," but also community-based natural resource areas and other agricultural areas. ERZ activities relate to both ERZ management and to human use in the broader landscape. Multiple-use approaches for use and protection of forest resources in a sustainable manner are both compatible and desired.

Local communities, partners, and affected interests must participate in both landscape and specific site planning by concessionaires to meet many natural resource and development goals.

2.1g Monitoring

Effective monitoring of forest and wildlife conditions in ERZs and adjacent areas is necessary to properly assess the impacts of extractive operations on biodiversity, and to measure the success of mitigation measures. Changes in vegetation composition, forest structure, tree regeneration rates, and presence and abundance of key species are some measures that can be used to evaluate the effectiveness of conservation measures in response to extractive activities in forests. Monitoring provides a solid basis to adjust the management and safeguards. The socioeconomic component of monitoring should focus on evaluating human welfare surrounding concessions, people's perceptions of the concession, as well as the intensity, diversity, spatial and temporal distribution, and other patterns of natural resource use.

Carefully design the monitoring plan to determine the best indicators of environmental and social impacts, as well as the intensity of monitoring necessary for the desired results. Unsuccessful monitoring efforts are usually due to inadequate study designs.

Monitoring activities can also include industry reporting of their activities to examine whether concessionaires are following national laws, management plans, community agreements, or any agreed-upon biodiversity conservation measures.

2.2 Concepts for Timber Extractive Zones

2.2a Selective Harvest and Rotations

In Central Africa, timber harvesters typically select commercially valuable trees, rather than removing all or even a majority of harvestable trees. They harvest the largest trees of the most valuable species, leaving forests with few currently commercially valuable old-age trees and, significant numbers of residual trees. The remaining trees are often a mix of species and age

classes that do not have an international market to justify their removal and the younger cohort of commercially valuable species.[12]

Indeed, of the more than 100 species of trees in the Central African forest, less than a dozen represent the vast majority of species and volume harvested (e.g., Sapelli, Sipo, Okoume, Wenge, etc.). The harvest may be as low as 1 to 2 trees per hectare. This leads to some reduction in vertical forest structure by removing the top canopy trees and horizontal forest structure as gaps in forest cover occur where trees fall and are removed through skidding. Leaving some habitat elements and forest patches not logged throughout the concession may provide better sources of plants and animals that may have a crucial ecological role in long-term forest sustainability, including regeneration of logged areas and the replenishment of non-timber products in logged forests.

Harvest is scheduled over an area in a series of areal blocks, typically, covering 5 years of harvesting area. The number of blocks and, consequently, the number of annual cutting areas in the concession usually corresponds to the number of years in the rotation. Normally, one annual cutting area will be scheduled for harvest in each year. As the scheduled year for harvest approaches, intensive preparation occurs such as more detailed surveys and inventories of the harvestable trees in the area, design and construction of the road system, and identification of special habitats or leave areas. These will often be contained in a 5-year plan or annual harvest plan. When harvest occurs, it involves selectively harvesting the target species that have achieved the specified minimum diameter. Target species are determined based on market values, species promoted for market, and species reserved from any harvest, based on national regulation and/or the concession management plan.

Rotation is the length of time between one entry in a forest area to harvest trees and the subsequent entry into the same area to harvest trees. This time period is typically a fixed length in Central Africa, ranging from 25–40 years. The rotation length selected influences other parameters affecting the harvest such as the species that can be harvested and the minimum diameter the trees must have attained to be harvested. Generally, the longer the rotation, the lower the minimum diameter, and the more trees can be harvested at each entry. Determination of the minimum diameter for a specified rotation is designed to provide a comparable number of trees and wood volume of the same species to be available in the subsequent rotation; thus indefinitely sustaining continued harvest of these trees. Figure 2 is a map showing an example of an overall rotation area and scheduling.

Nevertheless, concern remains on: 1) weak natural regeneration of certain key species (e.g., Sapelli), and 2) ultimate impact of "high grading," or the selective harvest of the tallest, straightest, most disease resistant, etc., trees, on the long-term ability of the forest to deliver ecosystem services under current management practices.

[12] A simple illustration of the "basis for sustainable forestry" can be found at the Danish DLH Group subsidiary website: http://www.tt-timber.com/maps/waldkreislaufneu.html.

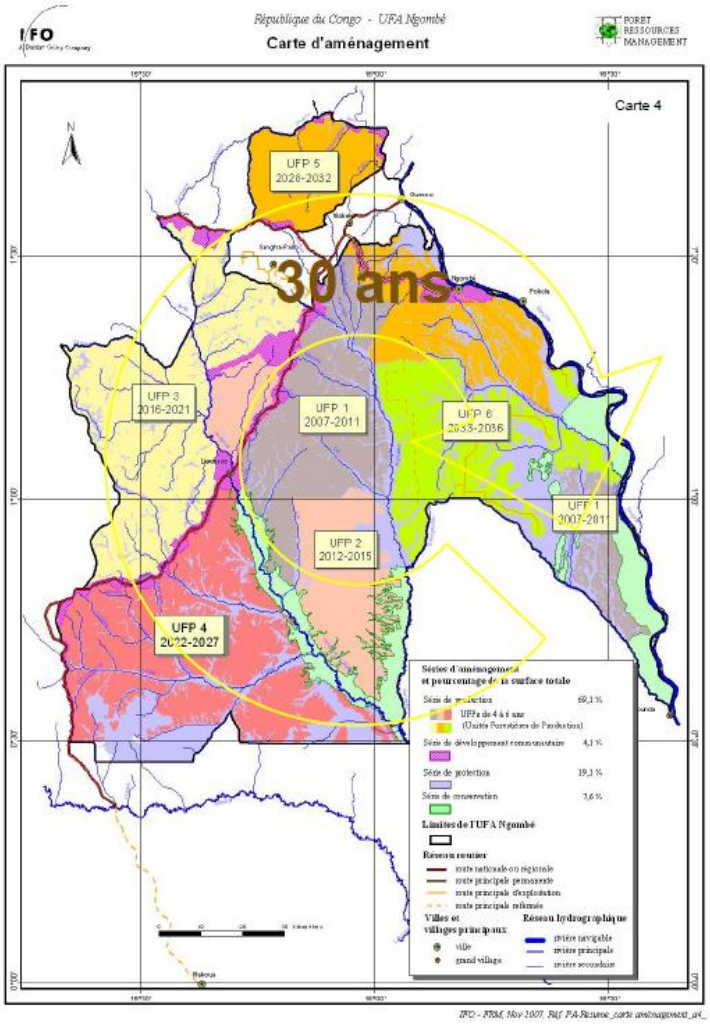


Figure 2. Example forest management map (UFA Ngombe)[13]

2.2b Managing Timber Planning and Harvest

Pre-harvest inventory and mapping of commercial tree species define volume and tree species to remove, and identify annual cutting blocks and extraction networks. Geo-referencing tree inventory data in a geographic information system (GIS) can greatly benefit logging companies. Maps of tree species and topography can be used to optimize extraction routes and gain efficiencies. The location and size of tree species also provides data essential for identifying keystone food resources and forest conditions required for wildlife species targeted for protection.

For annual tree harvest plans (operational plans) to be consistent with overall forest management plans, they must consider several changing variables during a multi-year concession. Levels of harvest are often adjusted from year to year because of factors such as timber product market prices, fuel costs, international and local economic conditions, management plan compliance, socio-economic factors, and wildlife population and habitat conditions.

[13] Plan d'Aménagement UFA Ngombé, Nov. 2007 - Résumé public 01 Mar. 08

Type of tree-felling procedure and removal practices can significantly influence the state of residual trees, and thus, post-harvest forest development and wildlife habitat. Reduced-impact logging techniques help minimize the environmental impact of timber extraction on the forest and can benefit wildlife and the entire ecosystem by reducing damage to residual trees and thus supporting forest productivity and maintaining quality wildlife habitat. As a general rule, reduced-impact logging techniques should be promoted in all production forests, especially where forest and watershed conservation is a priority—and especially those identified for high-priority wildlife conservation. To reduce impacts on forest structure and biodiversity, reduced-impact logging measures include:

1. cutting vines prior to harvest to reduce damage to neighboring trees;
2. directional felling and cutting stumps low to the ground to mitigate negative impacts, improve worker safety, and increase efficiency; and
3. planning and constructing skid trails and landings to minimize soil disturbance, erosion, stream impacts, tree regeneration, and forest access.

Although an increasing number of concessions are using such techniques, less sophisticated logging concessions are more the norm across the subregion, and arguably merit more attention due to their presumed impact on the sustainability of the timber resource, biodiversity values, and other ecosystem services.

2.2c Conserving Wildlife and Cultural Features

A poorly managed timber concession can adversely impact neighboring human communities far beyond the loss of harvested trees. Depleted or degraded forest resources have a deleterious effect on community health and local economies. On the other hand, responsible timber concession holders can also play a unique role by providing improved transportation infrastructure, and socio-economic returns from a portion of timber profits that can be used for energy, education, health, or improved agriculture projects. Considering wildlife and other resource and community values during the planning phase of timber harvesting can reduce adverse impacts to wildlife populations, benefit human socio-economic values and needs, and reduce conflicts among concessions and local populations.[14]

Conservation, protection, or set-aside zones where few, if any, trees are harvested are often identified in a concession because of topography, soil conditions, marshes or low tree densities, or legal considerations. Biodiversity concerns rarely ever factor into these zoning decisions, so it is important to find a compromise solution that takes into account both the economic priorities for choosing the set-asides and biodiversity concerns. If properly identified, such areas may be very important to wildlife species as habitat refuges and corridors for numerous species using concession lands post-harvest. Moreover, special human-use zones are likewise frequently identified in concessions codifying certain local community resource use and access. Section 4.3 further elaborates these concepts.

[14] International Union for Conservation of Nature (IUCN). 2007. *Best Practice Guidelines for Reducing the Impact of Commercial Logging on Great Apes in Western Equatorial Africa*, Occasional Paper 34, 31pp.

2.2d Reforestation and Regeneration

After timber harvest, most forest concessions are comprised of varying densities, sizes, and ages of both commercial and non-commercial tree species. Where residual tree volume is very low (or where subsequent felling of residual trees occurs from illegal harvest and agricultural pressures), regeneration of desired commercial tree species can be problematic. Moreover, additional effort is needed to understand and identify solutions to the observed poor natural and artificial regeneration performance of several key species (e.g., Sapelli). Concessions can facilitate natural regeneration and minimize damage through detailed selection harvest decisions and reduced-impact logging. Reforestation with commercial tree species should be undertaken in harvest areas, including log landing and loading areas, roads, and abandoned facilities.

2.2e Information Needed for Effective Concession Planning

Certain baseline information is needed to identify and evaluate how extractive resource activities affect, and are affected by, other natural resources and human conditions and values. Examples of the information and data that may be available or still needed for a concession and its immediate area:

- inventory of tree species, their characteristics, numbers, and distribution
- knowledge of the current conservation status of large mammal populations
- wildlife habitat conditions, and conditions of key habitat components
- water quality, quantity, and users of rivers and streams that will be affected by the extractive activity
- road networks, how people use roads now, and how population and immigration trends forecast people will use roads in the future
- amount and location of both illegal and legal bushmeat and trophy hunting
- amount and extent of illegal exploitation and trade of timber and mineral products
- overall current indigenous and local communities' natural resource use patterns
- current and future sources of food provisioning for indigenous and local communities
- current and anticipated job, housing, health, and education conditions

2.2f Other Concepts Pertinent to Timber Extractive Zones

Certification of Forest Management

Global tropical timber markets are a vital source of export-based revenue to support economic development in the exporting nation. International demand for wood, minerals, and special forest products is stimulating certain forms of rural development in the Central African forests. That said, international concern for sustainable forestry practices has led to increased efforts on the part of forest concessionaires to better manage their ventures and obtain internationally recognized credible certification (Forest Stewardship Council, etc.). International demand for certified forest products is actually driving and facilitating many high-priority conservation actions.

Obtaining and maintaining internationally recognized forest management certification helps to ensure sustainable forest conditions, while minimizing environmental degradation. Benefits and costs of obtaining certification are diverse and accrue at local, regional, and international scales.

By following internationally recognized standards for forest management, concessionaires may acquire eco-friendly reputations, maintain or increase market share and/or access, possibly benefit from a price premium, and gain the goodwill of local communities. With many world markets requiring sustainably managed and certified timber products and with governments pressured to regulate and enforce the use of their timber resources more effectively, timber companies are increasingly turning to certification schemes to credibly demonstrate the sustainability of their operations.

Carbon Sequestration, Emissions, and Sustainable Forest Management

The forests of Central Africa play a critical role in storing and sequestering carbon and substantially contribute to regulating climate. Deforestation and forest degradation contribute significantly to carbon emissions, with estimates ranging between 12–20 percent of total global CO_2 emissions. In 2005, the Coalition of Rainforest Nations proposed an approach to REDD.

The ongoing international debates under the United Nations Framework Convention on Climate Change and related fora have included REDD+ which expands the scope of possible activities under an international agreement to include not only avoided deforestation but also reforestation, forest conservation, and sustainable forest management.[15] The Copenhagen Accord resulting from the 15th Conference of the Parties in Copenhagen included a formal recognition of REDD+ along with a decision on the methodological guidance.[16]

REDD and related programs will present new opportunities and challenges for managing ERZs in forest areas of Central Africa. New and revised planning for ERZs should be familiar with these programs.

2.3 Concepts for Mineral Extractive Zones

Mining and energy development continue to be critical components in economic development strategies of Central African countries. Such projects provide direct employment opportunities, as well as many indirect economic activities. Therefore, it is important to monitor social and environmental impacts closely to ensure laws and norms are followed and negative impacts are mitigated.

2.3a Mineral Extraction Issues and Impacts[17]

During the past few decades, large-scale mining has expanded rapidly to the most remote and biologically rich areas of the globe. While corporate behavior with respect to the environment has improved, mining activities located in environmentally sensitive areas can have adverse effects on biodiversity.

The larger the mining operation, the greater the use of natural resources such as energy and water, and the greater the generation of waste products. Moreover, water consumption, energy,

[15] Karsenty, A. 2009. What the (carbon) market cannot do... *CIRAD Perspectives Forests/Climate change No. 1*. Paris.

[16] - Copenhagen Accord: http://unfccc.int/files/meetings/cop_15/application/pdf/cop15_cph_auv.pdf
- SBSTA decision on methodological guidance for REDD-plus: http://unfccc.int/files/na/application/pdf/cop15_ddc_auv.pdf

[17] *Chemonics*, 2008.

and waste generation, depends on the extraction method (e.g., open-pit; underground; alluvium sifting), mineral types, and the location. Engaging with large-scale formal operations, however, may be easier than informal illegal mining sites. Large-scale operations usually have a centralized authority and significant infrastructure development that can use high-tech and environmentally responsible techniques. Large-scale operations may also substantially invest in the long-term future of the country, although that is not always the case. In contrast, informal illegal mining involves numerous miners, and the authority for the operations may be unclear. Techniques are likely to be more primitive, emphasizing cheap extraction methods rather than long-term environmentally responsible operations.

Formal mineral exploration begins with geologic reconnaissance and geochemical and geologic sampling. These stages may be relatively benign, if no access routes are opened. In the final stages of exploration, drill rigs may be needed and access tunnels built. At this stage significant surface disturbance can take place, and the movement of drill rigs usually requires the opening of access routes, greatly increasing the threats to biodiversity. The exploration stage of mining generally receives the least scrutiny from government agencies, NGOs, and the public.

Mining activities may be categorized into four broad classes: 1) underground mining; 2) open-pit mining; 3) large-scale alluvial deposit mining; and 4) informal illegal mining.

1. Underground mining

Underground mining requires the construction of underground tunnels to reach the mineral lode, but produces less waste than open-pit mining. Underground mining also occupies less surface area and causes fewer disturbances to plant and animal life than either alluvial deposit or open-pit mining. Nonetheless, underground mining has significant environmental impacts such as the generation of mine tailings and associated impacts, and water and energy consumption. Underground mining also entails greater need for safety and potential higher risk to miners.

2. Open-pit mining

Open-pit mining removes the rock and sediments that overlie target lodes. This overburden is piled near the mine, and covers a large area, creating a source of sediments that may block naturally occurring surface drainages, and wash into rivers, lakes, and lagoons. The open pit continues to grow deeper and wider as the mining operation progresses, and if deep enough, may contaminate the water table. Open-pit mining uses large earth-moving machinery that requires access routes. And, dynamite and excavation machinery generate significant noise and dust.

Wet dredging of surface deposits using dredges and dredge ponds is similar to open-pit mining. Water is used to mobilize the ore. Permanent impoundments are left behind in lieu of recoverable land, and pose public health risks from water-borne diseases as well as public safety risks such as dam and embankment failure, resulting in flooding.

3. Alluvial deposit mining

Alluvial deposit mining in Africa is primarily used for diamond and gold extraction. Diamond mining digs and sifts through mud, sand, and gravel. Large-scale alluvial diamond mining is usually conducted on fresh riverside and channel deposits. The entire river is diverted into an artificial channel and heavy machinery moves the alluvium. Sifting uses vast amounts of water

sprayed under high pressure to wash away fine sediments, leaving gravel and precious stones on the sieves. The washed sediments usually flow into adjoining rivers and streams, causing local and downstream siltation.

4. Informal illegal mining

Informal illegal mining is usually conducted by large numbers of people who dig pits in alluvial deposits without obtaining permits or following other legal requirements. Shovels, hand-held sieves, and even bare hands sift the alluvium for diamonds.

The environmental impact of a mining operation is linked to the characteristics of the target mineral. For industrial minerals such as rocks, clay, and sand, adverse impacts are usually due to the large amounts of extracted material in open quarries or adjacent to rivers. Increased sediment loads and alteration of drainage patterns can occur. Contamination by separation chemicals is usually not a concern for most mining. Other minerals, however, require chemicals that are highly toxic to humans and the environment.

Throughout the life cycle of a mining project, mining activities affect biodiversity both directly and indirectly. Many direct impacts have been mentioned, such as loss of habitat, sedimentation and/or pollution of water, drastic altering of water flows, etc. Indirect impacts are significant, but often difficult to quantify. For example, mining-related infrastructure (e.g., roads, railways, pipelines, and power lines) attract people and their families seeking employment and to benefit from the largely informal service sector. Significant biodiversity impacts occur as people clear land for settlement and farming, hunt and poach wildlife, and gather wood and other forest resources.

2.3b Mining Environmental Impact Assessments/Studies

In most countries of Central Africa, basic legal requirements and processes appear to be established for planning mining concessions and evaluating environmental impacts. Application and enforcement of legal and regulatory frameworks, however, remain a significant challenge.

International norms for an Environmental Impact Assessment (EIA) or an Environmental Impact Study (EIS) are generally expected to include discussion of the following:[18]

- adequate baseline data, especially surface and groundwater resources, as well as biological resources and ecosystem integrity and conditions;
- environmental costs, including those associated with regulatory oversight, monitoring, reclamation, closures, and post-closure monitoring and maintenance;
- a range of scenarios (including worst-case and no-go) and appropriate response strategies, including emergency spill and accident plans;
- biodiversity and ecosystem conservation or restoration strategies; and,
- cumulative, direct, and indirect impacts resulting from project development.

Moreover, typical phases for the EIA or EIS include:[19]

[18] Source: Miranda, Marta, David Chambers, and Catherine Coumans. 2005. "Framework for Responsible Mining: A Guide to Evolving Standards," WWF and Center for Science in Public Participation as found in *Chemonics*, 2008.
[19] *Chemonics*, 2008.

- Project Screening – Environmental and social sensitivity
- Setting the Scope – The boundary of the EIA and description of project and baseline
- Implementation of the assessment or study – Identification of key impacts
- Evaluation – Review of EIA findings and identification of mitigation, avoidance, and compensation measures
- Presentation – Non-technical for public consumption
- Review – By independent experts and public
- Decision making – Go, no-go, or go with conditions
- Monitoring – Implementation and effectiveness of mitigation measures

Enforcing EIS

The Ministry of the Environment of Gabon in 2008 temporarily stopped activities related to the development of a significant mining and hydroelectric project to ensure that the appropriate processes and procedures were being followed (e.g., completion of an EIS).

2.3c Mineral Extraction Processes and Expected Impacts

The following table (figure 3) depicts potential biodiversity impacts at each step of a typical mining operation.

2.3d Challenges and Strategies for Promoting Best Management Practices in Mineral Extraction

USFS field assessment missions in Central Africa in 2009 identified a number of findings regarding the current status of mining in Central Africa:

- Decisions on authorizing activities related to mineral and energy development appear to be made at the highest levels of government, in many cases without consulting local communities affected and/or the ministries mandated with land management. Moreover, the Ministry of Mines and the other land-management ministries do not seem to be collaborating sufficiently with each other, let alone other partners, when it comes to permitting mining operations.
- There appear to be loopholes in protecting national parks from mining and energy development. Furthermore, there is a lack of clear framework and procedures for conflict resolution for how governments manage mining concessions that overlap with forest concessions or protected areas.
- It is unlikely that environmental planning laws are being fully implemented for mining and/or energy development projects. Moreover, the EIS process, contents, and requirements, as they exist in the law and regulations, prior to mining operations are not well known to field-level stakeholders.
- Local expertise may not be present to sufficiently evaluate mining proposals to limit environmental impacts, other than in some mining companies.
- It is unclear what norms will be enforced regarding limits placed on road access, and how workers and their families will be housed and fed to support mining operations.

MINING LIFECYCLE PHASE	POTENTIAL IMPACT ON BIODIVERSITY
Exploration	
• Geophysical/ airborne surveying • Drilling/trenching • Blasting trenches • Developing camps during exploration • Building roads	• Habitat lost or fragmented • Species lost • Suspended sediment in surface water increased due to runoff of sediments • Breeding/calving seasons of marine animals disturbed or disrupted; local communities disturbed • Demand for local water resources increased • Fuels and other contaminants spilled • Human colonization increased due to road development
Site Preparation/Mineral Extraction	
• Constructing mines (removing vegetation, stripping soils, etc.) • Developing mine infrastructure (power lines, roads, , dams, rail lines, ports, etc.) • Constructing plants, offices, and other buildings • Building mine camps • Creating waste rock piles • Creating low- and high-grade ore stockpiles • Blasting to release ores • Transporting ore to crushers for processing	• Habitat lost or fragmented • Surface and ground water contaminated by chemicals • Populations of plant/animal species decreased • Terrestrial and aquatic plants and animals exposed to toxic substances • Landscapes altered • Demand for utilities increased • Erosion and siltation increased • Dust/fumes created by explosives • Human colonization increased due to road development • Species lost due to illegal and unsustainable bushmeat hunting for commercial trade
Processing/Smelting	
• Milling/grinding ore • Leaching/concentrating ore using chemicals • Smelting/refining ore	• Chemicals and other waste discharged in surface waters • Sulfur dioxide and heavy metals released • Demand for electrical power increased
• Transport to Final Markets	
• Packaging/loading final product • Transporting product	• Disturbing noise created • Dust/fumes created from stockpiles
• Mine Closure/Post Operation	
• Reseeding and replanting vegetation • Re-contouring waste piles/pit walls • Fencing dangerous areas • Monitoring seepage	• Persistent contaminants released into surface and ground water • Expensive, long-term water treatment required • Organisms exposed to persistent toxicity • Original vegetation/biodiversity lost • Pits/shafts that pose hazards abandoned • Windborne dust created

Adapted from *Mining and Critical Ecosystems: Mapping the Risks*, World Resource Institute, 2003

Figure 3. Impacts on biodiversity at various stages of mining operations[20]

USFS missions have made several recommendations for engaging operators in mining zones on the CBFP Landscapes:

[20] *Chemonics*, 2008.

- NGOs in support of the government authorities should continue evaluating engagement opportunities to influence the mining sector to help achieve landscape objectives at various stages in a mining operation: prospectus development, exploration, production, and post-production. Such an evaluation will likely yield differing engagement strategies at different stages. Across the board, it will be advantageous to build information-sharing opportunities through creating and maintaining the structures / institutions / platforms to leverage dialogue with decision makers.
- NGOs and the international community should work with governments to establish a team of technical "mining and mine-related impact" experts as advisers to national governments and/or landscape partners to assist in evaluating the environmental impacts of mining proposals.
- When possible, surveys of mineral deposits should be part of all initial landscape planning to recognize likely mineral development early in the process.
- Executive and parliamentary branches should clarify procedures to avoid or mitigate land use conflicts in mining concessions. High-level and inter-ministerial (namely forest, mining, planning, and fauna ministries) procedures are needed to avoid or mitigate conflicting land uses. As mining permits and concessions are allocated over other land uses, clarity from the highest level of government is needed as to what is allowable (e.g., mining permits in national parks?). Where a permit is determined valid, clarity is needed regarding the mitigation measures, conflict resolution, and compensation procedures to take when differing land uses are proposed for the same area.
- Mining interests should be expected to fund processes to evaluate development proposals, develop management plans that adequately consider environmental effects, consult stakeholders, amend the plans of other management zones (as needed), and fund necessary mitigation (including adding replacement areas if needed) to meet key conservation goals.

Strategies for supporting best practices*

- Mining Partnerships
- Working with Governments to Create Comprehensive Environmental Regulations – Governments
- Working with the Government to Develop Long-Term Land Use Plans
- Use an Environmental Management System (EMS)
- Ensure employee familiarity with environmental practices
- Produce a rehabilitation plan

Additional resource:
A very detailed publication, complete with checklists, is the "Good practice guidance for mining and biological diversity" from the International Council on Mining and Minerals.

* *Chemonics*, 2008.

2.4 Concepts for Oil and Gas Development Zones

Potential biodiversity impacts during oil and gas exploration, construction, and production are shown in figure 4. Operations may be on- or off-shore, thus bringing in a near suite of potential biodiversity, wildlife habitat, and local community issues. Unlike clear locatable minerals, oil and gas may involve extensive surface development in terms of drill locations, collection facilities, roads, pipelines, etc., but less in terms of earth removal. Operations are very capital-intensive and, therefore, frequently once established, are present for decades or more. Due to

this capital investment, access is often very closely restricted and monitored, which may bring benefits to biodiversity and wildlife.

OIL AND GAS ACTIVITY	POTENTIAL IMPACT ON BIODIVERSITY
Exploration Stage (seismic drilling, etc.) – Onshore	
• Creating access (airstrips, temporary roads, etc.) • Setting up/operating camps and fly camps • Using resources (water, aggregate, etc.) • Storing fuel • Using explosives • Closing shot holes, mud pits, camps, and access infrastructure • Mobilizing drill rig • Conducting drilling operations • Conducting well testing/flaring	• Plants and their habitats disturbed or damaged • Animal populations subject to increased noise • Soils and watercourses disturbed • Soil, surface, and groundwater contamination • Landscape modified
Exploration Stage (seismic drilling, etc.) – Offshore	
• Mobilizing/moving vessels • Operating vessels that produce emissions and discharges • Conducting seismic operations • Anchoring on sea floor • Using chemicals • Discharging mud and cuttings • Fuelling/handling fuel	• Fish disturbed • Breeding/calving seasons of marine plants and animals disturbed or disrupted • Sediment and deep-sea organisms disturbed • Sediment contaminated • In event of oil spill/leak, seabirds, coastal habitats, etc., disturbed or damaged
Construction Stage – Onshore	
• Setting up/operating construction camps • Providing access for construction • Using resources (water, timber, aggregate, etc.) • Importing heavy equipment and machinery • Moving vehicles • Moving earth (excavation)/laying foundations • Storing/using fuel and construction materials • Generating construction wastes • Road building	• Temporary and permanent loss of habitat and component ecological populations due to temporary and permanent footprint • Soil eroded and agricultural productivity reduced • Soil, surface, and groundwater contaminated • Cultural heritage damaged
Construction Stage – Offshore	
• Mobilizing/moving vessels • Using vessels that produce emissions and discharges • Anchoring/piling • Transshipment of equipment and from vessels.	• Disturbance to sediment, benthic fauna, and other seabed flora and fauna • Loss of seabed habitat • Disturbance of marine animals breeding and calving • Introduction of invasive species
Operation/ Production Stage – Onshore	
• Establishing a physical footprint and visible presence • Importing/exporting materials and products • Handling/storing/using products, chemicals, and fuel • Using liquid effluent • Releasing emissions to atmosphere • Creating noise • Using artificial light sources	• Long-term landtake effects on ecology • Landscape disturbed or damaged • Soil and groundwater contaminated • Water quality and aquatic ecosystems disturbed or damaged and resource users (such as fishermen) unable to secure customary resources • Air quality worsened and human health adversely effected
Operation/ Production Stage – Offshore	
• Establishing a physical footprint • Storing/handling/using chemicals • Releasing emissions to atmosphere • Using helicopters and standby vessels to transport supplies (which creates noise) • Releasing discharges into the sea • Using artificial light sources	• Loss of seabed habitat • Fishing efforts interrupted • Breeding/calving seasons of seabirds and marine mammals disturbed or disrupted • Water quality worsened and marine ecosystems adversely effected • Air quality worsened and global warming increased • In event of oil spill, marine and coastal resources disturbed or damaged

Adapted from Shell's draft "Integrated Impact Assessment: Environmental Impact Assessment Module," EP 95-0370 (May 2002).

Figure 4. Impacts on biodiversity at various stages of oil and gas operations[21]

[21] *Chemonics*, 2008.

2.5 Concepts for Safari Hunting Zones

Central governments in some countries grant private companies safari (sport) hunting concessions to provide guide service for controlled and sustainable hunting of non-protected wildlife species. Safari hunting concessions are often co-located on lands that are part of logging concessions. The most sought-after species are bongo, sitatunga, elephant, and forest buffalo. Often, each private company (safari guide) is issued a certain number of permits to take animals. The safari guides then pay fees and taxes to the government for the right to guide hunters, and employ members of local communities to support these ventures. They are required to conduct annual surveys of hunted wildlife populations, and also contribute to detecting and deterring wildlife poaching in areas where they operate. Nearby communities generally benefit from some of the economic activities associated with safari hunting.

2.5a Detailed Inventory of Target Game Species/Populations

Management of game species for safari hunting requires estimating population sizes, conservation status, habitat conditions and trends, the ability of wildlife populations to thrive under varying hunting pressures, and influences of other human activities. Such information is vital when granting safari hunting concessions, establishing annual quotas of big game species, and supporting the development of the safari hunting management plan.

The capability of government agencies to collect such information is usually very limited and the methodology for inventories and criteria for allocating quotas are often not transparent. Therefore, scientifically credible and transparent methodologies for inventorying and generating annual quotas should be established. NGOs in support of the governments, and in concert with concessionaires and other stakeholders, should encourage creation and implementation of scientifically credible and standard protocols to determine the effect of safari concessions on target and non-target species of concern. International, regional, and local conservation NGOs can be a source of expertise for such surveys, inventories, monitoring, and plan development.

2.5b Unique Community Involvement Factors

Safari concession activities can contribute significantly to local economies by providing jobs, stimulating commerce, and contributing to the maintenance of transportation infrastructure. Although safari concession operations are often seasonal, the economic activity is important to local communities.

Additionally, in certain circumstances, safari operators partner with organized local communities (e.g., COVAREF) to gain access to certain hunting grounds, and in return, provide a form of rent and small project support directly to the community, as well as tax revenue to the government; an interesting model of community-based wildlife management.[22]

Moreover, the benefits include support for anti-poaching activities. For example where local communities derive more benefits from safari hunting than poaching, they will have a stake in

[22] COVAREF - Comité de Valorisation des Ressources Fauniques / Wildlife Valorization Committees are basically a formalized community-based governance and wildlife management structure promoted in Cameroon to facilitate broad engagement in forest, related community natural resource management issues, and even micro-project development, selection, implementation, and monitoring and evaluation.

controlling their own and outsiders' poaching to sustain wildlife populations needed for safari hunting. More specifically, certain safari hunting operators provide support to a broader wildlife management program through anti-poaching efforts and support in partnership with governments, communities, and NGOs.

2.6 Concepts for Large-scale Plantations

The worldwide loss of forests through conversion to agriculture threatens biodiversity. Intensively managed plantation forests in Southeast Asia are an example of the threat to biodiversity. However, few forests in Central Africa have been converted to plantations. That may change as the investment climate improves and with increasing demands from the international biofuel market.

Plantation Forests and Biodiversity

A comprehensive review of the function of plantation forests examines the effects on biodiversity at the landscape scale, synthesizes context-specific effects of plantation forestry on biodiversity, and concludes:

- "Plantations can make an important contribution to the conservation of native biodiversity, but not if their establishment involves the replacement of native natural or semi-natural ecosystems. While a plantation stand will usually support fewer native species than a native forest at the same site, plantations are increasingly replacing other human-modified ecosystems (e.g., degraded pasture) and will almost always support a greater diversity of native species. As such, plantations can play an important role in sustaining native biodiversity in production landscapes—and indeed be an opportunity for biodiversity. As well as providing habitat in their own right, plantations play particularly important roles in buffering native forest remnants and in enhancing connectivity between areas of native ecosystems, including patches of primary forests, riparian strips, and amenity plantings.
- The opportunities afforded by plantations can be realized when particular attention to biodiversity informs management choices, and the objectives become multi-purpose (sustainable forest management). So, to sustain native biodiversity within plantations, forest managers need to consider using a greater diversity of planted species, extending rotation lengths in some stands, and adopting a variety of harvesting approaches. Managers also have to consider plantations from a landscape perspective and the contribution that can be made by planning the spatial array of individual stands or compartments of different age and species composition as well as natural or semi-natural conservation areas.
- Thus, we suggest that the role of plantations in biodiversity conservation can be enhanced if plantations are managed in a manner in which they can contribute to biodiversity conservation across the whole landscape, rather than focusing only on the values within the plantations themselves."

* Brockerhoff, E.G., H. Jactel, J. A. Parrotta, C. P. Quine, and J. Sayer. 2008. Plantation forests and biodiversity: oxymoron or opportunity? *Biodiversity Conservation*. 17: pp 925–951.

3.0 EXTRACTIVE ZONE LAND USE PLANNING PROCESSES

This section provides an overview of the key steps of the ERZ planning process and suggests specific ways in which CARPE implementing partners can engage in the process at different stages and in different contexts. Additionally, as CARPE implementing partners may not be able to realistically engage with all concessions in a given landscape, the following section provides some prioritization guidance.

3.1 Extractive Zone Planning in the Countries of Central Africa

In all countries of Central Africa, a management plan is a legal expectation for most concessions in ERZs. In practice however, plan completion may be deferred and resource extraction proceeds. CARPE implementing partners should give priority attention to key concessions not under effective plans.

Although formal approval for extractive zone plans is a national government decision, concession planning is carried out by the concessionaire or a hired consultant firm. Governments have limited resources and expertise for planning. However, concessionaires also have limited capabilities to plan and manage their concessions. CARPE implementing partners can often directly participate in or lead parts of the planning process through partnerships with the concessionaire and the appropriate government agency. Be cautious to avoid situations in which NGOs are effectively performing what essentially are government and concessionaire functions. Moreover, investments should support the governmental agencies' ability to effectively play their vital role in forest management.

In general, timber, safari, and mining concessions undertake a similar ERZ planning process:

1. Information and Data Gathering for the Planning Area
2. Participation of Local Communities and Other Interests in the Planning Process
3. Evaluation and Approval of the Plan
4. Implementation and Monitoring and Evaluation of the Plan

Figure 5 shows the steps in the process of elaborating a typical concession plan including notation of possible relation to CARPE partner contributions. The following sections introduce and expand the elements presented.

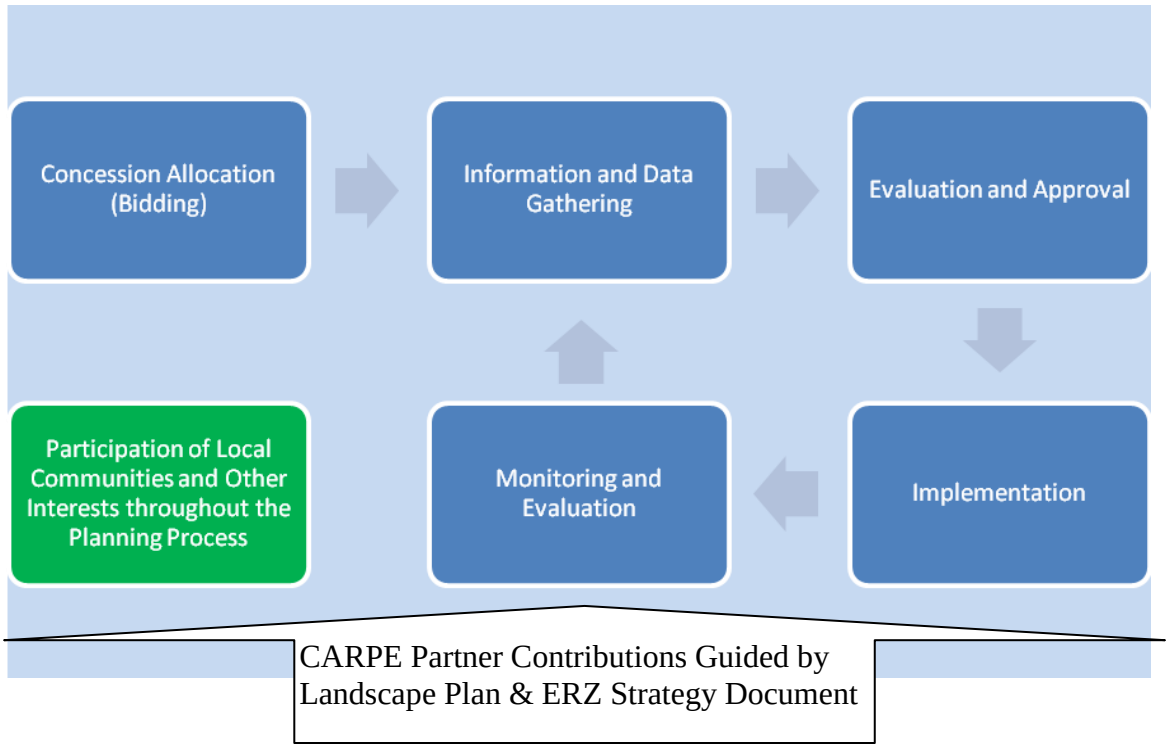


Figure 5 – Generalized flow chart of the process for concession plan development

Laws, rules, and procedures govern planning in each country. The countries differ in the current status of their concessions, the process of awarding concessions, and plans for concessions. While this guide highlights certain common themes across the region regarding ERZ planning processes, CARPE implementing partners should familiarize themselves with each country's planning process and international treaties applicable to the concession.

CARPE implementing partners typically serve in an advisory capacity, with one or two employees designated as extractive-resource planning liaisons to interact with the concession holders on specific planning tasks. Moreover, the liaison can then tap the skills of other individuals in the landscape consortium—foresters, biologists, hydrologists, social scientists, etc.—to assist and advise as needed.

Tasks:

1) *Initiate contact with the concession planner and government authority to develop a basic understanding of the planning process.*
2) *Understand the landscape-level plan design and how it may influence conservation objectives in the concession zone.*
3) *Develop a familiarity with the rules and procedures of the specific country for planning in the specific type of ERZ.*
4) *If it already exists, review the entire concession plan from a technical and strategic perspective.*

3.1.1 Gathering Information for the Planning Area

Early in the planning process, often before any formal planning steps may have occurred, the concession planner begins gathering and organizing information on geography, human inhabitants and settlements, flora, and fauna (see section 4 for a more specific description of plan information). Vital conservation information must be collected before major concession decisions. CARPE implementing partners are uniquely able to provide such information or work with the concessionaire planner to collect biodiversity and/or socio-economic information.

Information gathered during early planning phases may also be used to determine boundaries of concessions whose limits have not yet been determined. For example, in the Republic of Congo a number of factors and developments (e.g., a large population of lowland gorillas, low density of commercially valuable timber, difficult accessibility, and interest as a conservation corridor between protected areas) led to the removal of a significant area from the forest concession; some of it is under consideration for formal protected area status.

CARPE implementing partners should ensure information is adequate to determine the key conservation objectives for a concession (see section 3.2 for further discussion). This includes sufficient information on biodiversity inside and outside of the concession.

Tasks:

1) *Determine what conservation information is critical to the concession plan.*
2) *Work with the concession planner and other partners to identify information for the planning process.*
3) *Develop agreements to provide data for the planning process and monitoring during plan implementation.*

3.1.2 Public Engagement in the Planning Process

Successful concession planning serving both the interest of the concessionaire and the needs of public sector and civil society builds a foundation based on public participation in the planning process. The ultimate success of the plan and the concession will be based upon acceptance by the local community. Engagement of local citizenry is often legally required, as well as being necessary to understand their needs and aspirations. Failure to appropriately engage key government and local interests in planning and managing the concession may leave the concession isolated and unaccepted by the community.

At the outset, the planning team should develop a public collaboration plan that identifies stakeholders (or groups of stakeholders) to be contacted, a schedule for such contacts, and key subjects to address with the stakeholder.

The overall public collaboration plan could identify the following:

- stakeholders that must be included in the ERZ planning process;
- link these stakeholders have with the ERZ;
- how and when these stakeholders will be involved;
- methods of working with these stakeholders; and finally,
- communication tools used to successfully promote stakeholder participation.

In some concession planning, formal community associations, NGOs, or other individual community representatives may advise the concessionaire on the planning or management of the concession. Such individuals, associations, and organizations can continue to work together with other stakeholders in ERZ management long after plan completion and elevate stakeholder capacity in natural resource management.

At the very least, CARPE implementing partners should participate in the process and effectively represent the conservation objectives for the concession. An effective agreement (e.g., memorandum of understanding) with the concessionaire may allow participation in developing and managing the public collaboration process (e.g., outreach and education efforts to communicate conservation objectives). Just as the concessionaire needs to reach out to the community to establish acceptance of its management, CARPE implementing partners must reach out to the community to establish acceptance of their objectives (see section 3.2 for further discussion). Additionally, where appropriate, CARPE implementing partners can play a supporting role in convening other interested stakeholders, as well as synthesizing their expressed concerns and helping incorporate that back into the management plan.

Tasks:
1) *Seek opportunities to work with the planning team to develop the concession's collaboration plan.*
2) *Participate in appropriate workshops, meetings, etc., on the concession plan.*
3) *Use participation in the planning process to develop networks of influence in the community. These can assist in developing education and other forms of outreach.*

3.1.3 Evaluation and Approval of the Plan

The concessionaire planning team evaluates various alternatives for management and writes the ERZ management plan, which includes certain components (see section 4.0). Most countries also require some form of EIS that examines the plan, alternatives to the plan, and the environmental effects of their implementation. The EIS should evaluate the direct effects of the expected extractive activities under the plan, and the indirect effects that are likely to result from the concessionaire's related activities.

CARPE implementing partners should be involved in the effects analysis by examining the proposed plan and the EIS to determine if the concession is effectively responding to conservation issues. If either the concession plan or the EIS is deficient, CARPE implementing partners should identify and suggest more effective conservation measures in the plan and improvements in the EIS.

Finally, when the concessionaire submits the plan to the appropriate government authority, a series of public consultations are scheduled to present the plan and receive feedback from the broader suite of local and national stakeholders. Once any changes are incorporated, the government authority makes the final decision for adopting the plan. CARPE implementing partners can influence this decision by communicating with the national government at any stage in the process any recommended changes to the plan discussed earlier with the concession planning team (see section 3.2 for further discussion).

Tasks:
1) *Participate in evaluating and improving the plan by reading the documents and identifying and communicating changes to the concession planning team.*
2) *Determine whether the plan meets core conservation objectives for the area.*
3) *Communicate with the approving authority any reservations about the proposed plan and its EIS.*

3.1.4 Retaining Engagement in Monitoring and Evaluation after Plan Completion

Success of the plan is revealed through appropriate monitoring of what really happens on the ground and how that influences human communities, fauna, and flora. Monitoring provides a foundation of information to develop answers to these general questions:

- Are the plan and its provisions being carried out?
- Are environmental and social impacts occurring within expected norms?
- Is there information indicating a need to change the plan or concession management?

The first question ensures that management conforms to plan's direction. Without some checking either by the concessionaire or external organizations, personnel on the ground may knowingly or unknowingly apply practices that are inconsistent with the plan. Most companies will establish their own monitoring procedures to ensure compliance with the plan's provisions. Independent verification by the technical service of the government authority and/or a third party that such monitoring procedures are effectively implementing the plan provisions further ensures adequate plan compliance.

The second question responds to what is really changing in the ERZ. Specific protocols must be developed for collecting systematic information on baseline (pre-disturbance), altered (post-disturbance), and recovered (long after disturbance) conditions for the resources of concern. For example, systematic collection data on elephant abundance and distribution before a logging operation, during the operation, shortly after, and long after the operation can provide information on the response of elephants to such logging.

Finally, this information needs to be evaluated to determine what changes are needed to the plan itself or management practices occurring under the plan's direction. This should evaluate the following kinds of questions

- If the plan is not being followed, why not?
- What are the consequences, if any, of noncompliance with the plan?
- Is the plan unrealistic and should it be changed?
- If effects of concession management practices are creating environmental impacts other than those expected, should these practices and, therefore, the plan be changed?

Per regional norms, monitoring and evaluation should be done annually, with some evaluations done periodically over longer periods such as 5 years. The public should also be invited to contribute to evaluating the management plan and how effectively activities are being carried out. Corrections to the plan and/or management activities should quickly follow findings that indicate a need to change.

CARPE implementing partners can make an important contribution during plan implementation and should seek to develop a partnership with the concessionaire to assist in monitoring and evaluating a concession or participate regularly in public phases of ERZ monitoring and evaluation. CARPE implementing partners can provide independent and credible evaluation of the concession highlighting concession management of conservation objectives. A partnership can include CARPE partners being responsible for collecting certain information and playing a collaborative role in monitoring that information.

CARPE implementing partners should consider their objectives and the reputation of the concessionaire to determine its participation priorities. If a concession is widely viewed as failing to meet provisions of its plan, CARPE implementing partners may want to focus on monitoring that evaluates how well the plan is being implemented. If the concession seems to be doing a good job of plan implementation, then CARPE implementing partners may want to specifically monitor conservation objectives (see section 3.2 for further discussion).

Tasks:

1) *Begin communicating with the concessionaire to seek an appropriate role for participating in monitoring and evaluation.*
2) *Prioritize monitoring that can best be performed and that meets conservation objectives.*
3) *Organize and execute a program of appropriate monitoring.*
4) *Participate with the concessionaire in regular evaluations.*

3.2 Extractive Zone Planning in the CARPE Context

CARPE is fundamentally about conserving biodiversity in Central Africa through a program of sustainable natural resource development. At present, the program is focused on 12 forest landscapes selected for their biodiversity and conservation potential. Each of these landscapes includes protected areas, which are the anchors for biodiversity. Surrounding those anchors are often ERZs and CBNRM zones. However, not all formal extractive resource concessions, protected areas, or community lands will necessarily be targeted immediately for ERZ, PA, and CBNRM planning and management actions in the landscape. The landscape plan should identify through certain site-specific decision criteria where, what processes, as well as what implementation activities, need to be addressed first.

Management within these priority ERZs needs to blend the extraction process with the achievement of key conservation objectives. This means identifying key conservation objectives within the ERZ and conservation objectives that ensure the ability of the ERZ to provide connective habitat between protected areas and other macro-zones or even landscapes. CARPE implementing partners must also recognize that ERZs have a substantial human footprint that needs to be developed to provide the best social and economic opportunities for the people of Central Africa, while also limiting the extent to which this footprint impacts the identified conservation objectives. Finding the balance between these two goals is the task of planning in the ERZs.

3.2.1 Specific Partnership Roles for CARPE Implementing Partners

Different partners active in a given region often bring differing skill sets and institutional roles to ERZ management. The following themes and strategic activities are some CARPE partner

activities in ERZs representing the role they bring (or could bring) to potential ERZ engagement at the planning and/or implementation stages:

Theme 1 - Wildlife/biodiversity/habitat/ecosystem services

a) Developing and/or implementing an ERZ wildlife management plan (either as a standalone plan or a chapter in a broader multi-resource plan)
b) Identifying sensitive or otherwise important (from biodiversity conservation and ecosystem service maintenance perspective) micro-zones
c) Implementing a standardized methodology to wildlife management support across several ERZ companies in the same or several landscapes
d) Applied research, plots, inventories, and monitoring of the trends and threats to the environment within ERZ areas

Theme 2 - Local communities

a) Supporting the organization of local communities to voice their resource interests and manage their resources sustainably
b) Facilitating dialogue among extraction company, local communities, and land management agencies of the appropriate local, regional and national governments
c) Supporting partners in monitoring the implementation of formal social agreements between the private sector concessionaire and local communities

Theme 3 - Other partner engagement

a) Promoting and facilitating sustainable forest management (e.g., certification, training, other capacity building, etc.)
b) Reviewing and monitoring development of the EIS and implementation of the corresponding environmental impact mitigation measures for the ERZs
c) Training private and public sector technicians to carry out key functions of management planning (e.g., ecological inventories, socioeconomic studies, etc.)
d) Developing and implementing formal agreements (conventions, protocols, etc.) between stakeholders to clarify the scope of partnerships[23]
e) Engaging the national land management agencies and legislature vis-à-vis technical assistance for sound natural resource management policy implementation and/or reform

Depending on the biodiversity conservation significance of a given extractive resource activity, financial constraints, or other landscape-level decision criteria, not every concession in a landscape will be prioritized for CARPE partner engagement immediately. Moreover, where engagement is necessary, not all interventions are possible or needed in every ERZ, and therefore, some form of technical assistance gap analysis could help focus where engagement actions should be prioritized.

Generally speaking, determining where to devote energy in ERZs depends upon the:

1. importance of the concession/ERZ to attaining the ecological objectives of the landscape;
2. urgency and timing of taking action;
3. type and amount of effort required to achieve the desired result in the concession; and

[23] Best practices suggest that agreements should include some basic transparency expectations of documents, plans, and other outputs of a given collaboration to help ward off or otherwise manage eventual conflicts.

4. capability and interest of stakeholders in achieving desired results.

The following section discusses in greater depth the importance of the context of an ERZ in influencing what engagement actions might be useful when and where.

Tasks:

1) *Throughout the process, prioritize activities to focus on those actions most critical to effectively managing the ERZ and meeting landscape objectives. This task is ongoing, and the prioritization process should be used when evaluating data to gather, projects to implement, and monitoring activities to undertake.*

3.2.2 Discussion of How Context Informs Strategic Engagement Options

This section explores the orientation of CARPE implementing partners toward the types of engagement that might prove most useful in different contexts. Focusing on key aspects of concern within ERZs maximizes effectiveness both in terms of collaboration with governmental and private sector actors and strategically prioritizing and scheduling activities. A variety of historical activities and partnerships are related to extractive uses in the CBFP Landscapes that pose both obstacles and opportunities for establishing or continuing NGO activities.

Assuming the concession has met the biodiversity conservation need criteria for engagement established in the landscape-level planning, a prospective partner should consider the following contextual scenarios to better focus efforts within a given ERZ:

1) Political stability (stability threats or not)
2) Informal illegal logging or mining (present or not)
3) Village associations (present or not)
4) Presence of local communities close to or within the extractive concession (present or not)
5) Extraction concession or permit allocated (yes or no)
6) Extraction company expresses willingness to collaborate (yes or no)
7) History of exploitation (secondary or mature forest)
8) Extraction company possesses the technical capabilities (cadre of experts) to plan and implement (yes or no)
9) The extraction management plan (e.g., forest management) is completed (yes or no)
10) Extractive concession is or will soon be certified by a third-party scheme (yes or no)
11) Natural resource base is sufficient to facilitate long-term planning (yes or no).
12) Company is blatantly operating outside the law (yes or no)

Tasks:

1) Consider and identify the appropriate partnership role in the ERZ by analyzing the contextual scenarios for strategic engagement.

4.0 ERZ PLAN COMPONENTS

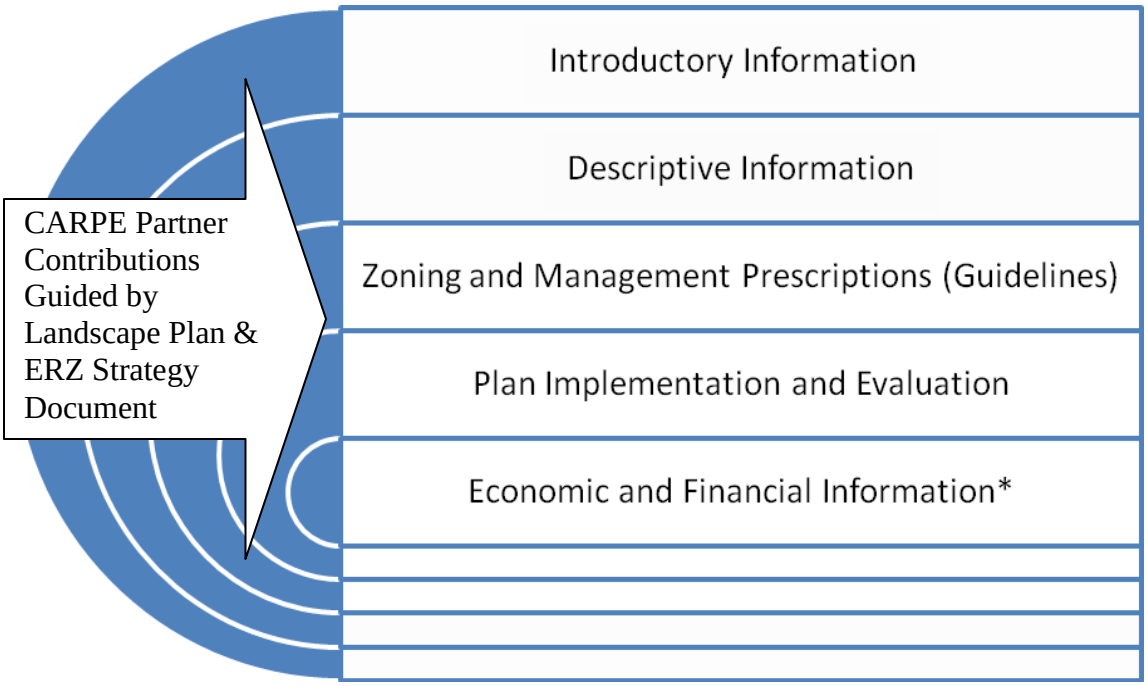
Extractive concession plans in the region contain a mix of descriptive information about the concession area, desired social and environmental conditions for the concession, and management practices. Most Central African countries have established through implementing regulations or handbooks similar content for their forest concession plans.[24] The focus of this section is forest management plans, because timber concessions are the dominant extractive land use in CBFP Landscapes. A basic summary of the content of forest concession plans follows, although the order, topics, and terminology may vary slightly for concessions in the different countries.

As noted in the previous section, law and practice in Central Africa place the concession company as the author of the plan with the authorized land management agency providing procedural and technical review, validation, and adoption. Municipal and provincial government, members of parliament/legislature, local communities, and civil society also play roles during plan development and consultation.

CARPE implementing partners' roles will likely vary, depending on many contextual aspects (see section 3.0). In this section, the operating assumption is that the given concession company is either actively developing a plan or has already completed a management plan. Each chapter of the ERZ plan highlights key contributions and/or points of engagement for CARPE implementing partners. And, other possible complementary written products developed by CARPE implementing partners in collaboration with other stakeholders are described. Additionally, many of these sections contain "Tasks" that will be required of CARPE implementing NGOs and used as monitoring tools by CARPE management.

Figure 6 describes the overall contents of the typical concession plan, including notation to possible relation to CARPE partner contributions. The following sections introduce and expand the elements presented.

[24] For example -Ministère de l'Environnement, Conservation de la Nature, et Tourisme. Julliet 2007. Guide Opérationnel Canevas de rédaction du plan d'aménagement. République Démocratique du Congo
-Ministère de l'Environnement, Conservation de la Nature, et Tourisme. Octobre 2006. Arrêté ministériel n036/CAB/MIN/ECN-ER/2006 du 05 Octobre 2006 fixant les procédures d'élaboration, d'approbation et de mise en œuvre des plans d'aménagement des concessions forestières de production des bois d'œuvre. République Démocratique du Congo
-Ministère de l'Environnement et des Forêts. Mai 2002. Arrêté n° 0222/A/MINEF/ 25 mai 2002 Procédures d'élaboration, d'approbation, de suivi et de contrôle de la mise en œuvre des plans d'aménagement des forêts de production du domaine forestier permanent. Cameroun.
-Ministère de l'Economie Forestière et de l'Environnement, République du Congo. Mars 2004. Directives Nationales d'Aménagement Durable des Forets Naturelles du Congo. République du Congo



* No CARPE partner role envisioned necessarily in this component

Figure 6 – Description of concession plan contents

4.1 Introductory Information

The plan's initial section provides basic information about the concession:

- Size, location, and configuration of concession lands (maps and satellite images)
- Short description of the concession's principal natural resources
- Context of the concession within the broader area of the environment
- Short description of the plan's main objectives
- identification of the concessionaire, their partners, and appropriate government agencies and administrators with responsibilities for the concession
- Date the concession was awarded to the concessionaire
- Legal context of the plan, including national laws and implementing regulations and related projects occurring in the concession or neighboring areas that are important in developing the concession's plan
- Introduction to the organization and content of the plan

The introduction may also include an overall discussion about the integrated vision or desired condition for the future of the concession lands, although such vision statements are not normally part of the required content of plans required by national governments.

Drawing from the vision and broader orientation identified in the landscape plan, along with the more specific desired conditions and objectives fleshed out in the ERZ strategy document, the

CARPE partner can seek to influence the high-level vision and objectives of management in the ERZ.[25]

Tasks for:
1) *If it already exists, review in depth the plan introduction.*
2) *Where it does not yet exist or formal revisions are forthcoming, seek opportunities to include the high-level vision and management objectives in the ERZ.*

4.2 Descriptive Information

This section describes the ecological, social, economic, and cartographic aspects of the concession area and immediate area, including:

- description of the geology, soils, climate, topography, hydrology, vegetation, and wildlife
- summary of the history of the area's human populations, including native (*riverain, autotochtone*) peoples, customs, organizations, and current changes in population (immigration, emigration)
- description of the area's infrastructure including the transportation system, (roads, rivers, air travel) and public institutions (schools, hospitals, and others)
- description of the principal economic activities of the people near and within the concession, including agricultural activities, hunting, fishing, other small enterprises (informal), especially those related to forest products, and a description of major enterprises such as agro-industry, mining, tourism, and commerce
- cartographic information is primarily basic map information about the concession itself. This includes the boundary of the concession, principal features in the concession (such as topography, rivers, roads, villages, etc.), vegetation stratification including any unique vegetation features, unique wildlife habitats, and other information

In addition to the basic descriptive information, the plan will usually include a summary or discuss intensive studies carried out for the plan such as:

- Forest inventory methodologies and results. It will include methodologies for both the overall "management" inventory and the annual intensive "exploitation" inventories for

Consolidate forest management data and continue harmonizing data collection methodologies to maximize its use for emerging requirements

Concessionaires, consultant companies, and NGOs have gathered a significant amount of data and may be using common methods that could provide opportunities for collaboration on large-scale analyses of forest conditions (biodiversity, reconstitution/regeneration rates, carbon stocks and flux, effects of habitat changes on wildlife use). These data will be of increasing interest under payment for ecosystem service initiatives and REDD.

Opportunities remain to standardize forest concessions' floral and faunal surveys for management planning and among CARPE partners, so limited financial resources are most effectively used for surveys and monitoring. With foresight and planning, initial inventories can be used as a basis for monitoring the impacts of concession management on biological diversity.

[25] ERZ strategy document - A planning tool for elaborating the management plan. It clearly outlines the overall approach CARPE partners take to achieve CARPE planning objectives for each ERZ and the specific activities needed to complete an ERZ plan (see section 4.6.2 for a complete discussion).

the overall management plan and the annual operational plans, respectively. This will include a description of harvestable and protected species within the concession, plus their size and volume distribution. This is the statistical foundation for key decisions related to the level of timber harvest. In some cases, the data must be organized for specific computer software.

- Wildlife within the concession, including important habitats or conditions that must be maintained.
- Human communities dependent on the forest, including descriptions of indigenous populations accustomed to hunting and gathering in the concession.
- Environmental impact that concession management is likely to have on the both the natural resources and human communities.

CARPE implementing partners can be involved in any or all specific studies if determined strategically important for achieving landscape-level desired conditions and objectives. This involvement can range from leading the study to simply reviewing its technical merit at a later stage. The right balance should be found between engaging sufficiently to influence the concession holder's role in landscape-level objectives and fulfilling the role via technical staffing requirement of the company, in effect, subsidizing concession operations.

Tasks:

1) *Complement or simply review descriptive information, depending on the strategic value of providing such a function, to meet broader landscape objectives.*

4.3 Zoning, Usage Rights, and Management Prescriptions

One of the most important decisions in the concession plan allocates lands into three different management zones:

- Production: Lands managed to produce timber
- Protection: Lands managed to protect specific land features such as rivers, wetlands, and steep slopes
- Conservation: Lands managed for conservation of specific wildlife and their habitats

Some countries also include a community zone within the concession for communities and community development. Other countries' plans will simply describe intended community development. Figure 7 provides an example of this level of zoning.

With these types of land uses foreseen in the laws, forest concession ERZs are geographically structured like a smaller-scale CBFP Landscapes with community zones for rural development and agriculture (analogous to CBNRM zones), conservation areas (PAs), and production areas (ERZs). Once underway across Central Africa, this micro-zoning provides even more opportunity for NGOs and other partners to assist concession holders and the government, particularly in the conservation and community areas.

Plans may contain specific sections describing protection measures for wildlife. These include measures to prevent poaching of species or to manage legal hunting activity within the concession. Programs of education and provision of alternative food sources may also be part of this section.

The mapping of zones is mutually exclusive (e.g., no two zones may be in the same place). Each zone has objectives and measures that describe zone management, including permitted and prohibited human uses. Some countries place all of the information about timber production with the production zone and community development in the community zone. Others describe them separately. The following sections briefly summarize this kind of information by zone.

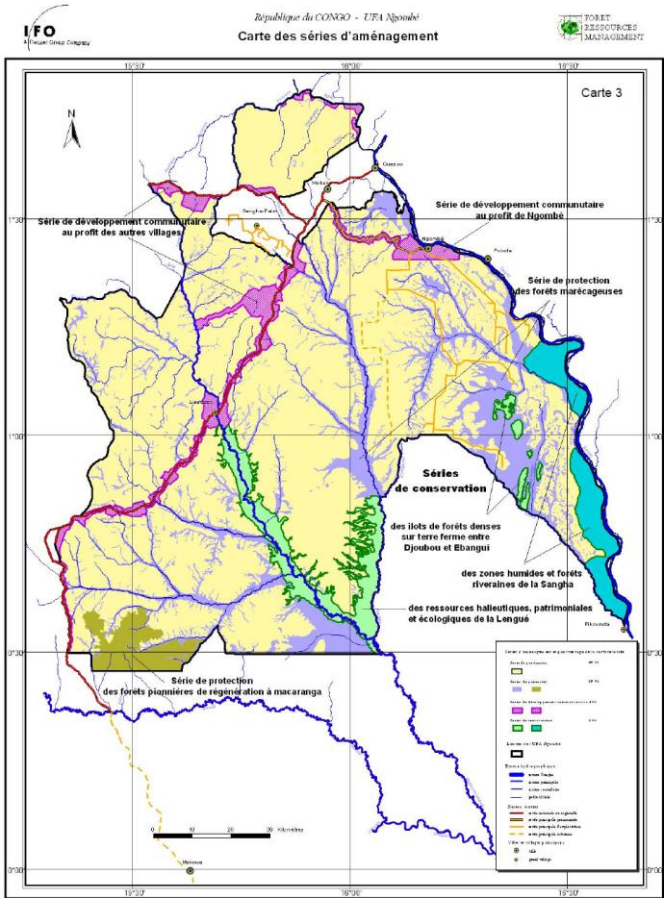


Figure 7 – Example forest management zoning map (UFA Ngombe)[26]

4.3.1 Production Zone

The production zone is usually the largest zone in the concession and devoted to sustainable timber harvest. All land in the zone is potentially available for harvesting trees unless specific restrictions indicate otherwise.

Whether located in the description of the production zone or in other sections, much of the plan will describe technical calculations related to the timber harvest:

- Tree species in the concession planned for harvest, species that may be harvested, and species that are protected.

[26] Plan d'Aménagement UFA Ngombé, Nov. 2007 - Résumé public 01 Mar. 08

- Minimum diameter for management for each species that may be harvested. The minimum diameter for management is either equal to or greater than the nationally established minimum diameter for harvest. This is the minimum diameter that a tree of each species must have to be harvested under the plan.
- Trees 40 cm larger than the minimum diameter for harvest may be set aside for future genetic sources.
- Rotation length. –Number of years between harvest of the same area or the number of years to completely harvest all areas in the concession.
- Annual harvest potential or the maximum volume in cubic meters that can be sustainably harvested annually, based upon a calculation using inventory information for the concession, rotation length, and a table of information for the growth rate of each species.
- Five-year harvest blocks. Areas identified on a map with the number of blocks equal to the overall duration of the concession contract (or the rotation period) divided by 5. Each block generally represents the same surface area and is divided into annual cutting areas either by surface area or expected production volume, depending on country-specific regulations. Generally, they represent a block of land that will be available for timber harvest in a specified 5-year period, and is usually closed to further harvest after that 5-year period.

Plans often contain much detail about calculations, such as timber volume or number of trees for each species, growth of each species, and volume by species in each 5-year block, etc. The minimum diameter by species, the maximum annual harvest, and limiting the area of harvest to a just a few land areas within a 5-year block are the primary controls used to ensure sustainable timber harvest in the production zone. Because these measures and management prescriptions are central to the sustainability of resource extraction, CARPE implementing partners may choose to focus on technical support and review of these calculations.

Management prescriptions for the production zone will also include rules for other techniques to conserve the forest and environmental damage mitigation such as reduced-impact logging. This includes measures to reduce damage to trees during felling and transport to landings. There may be specific measures on the location, construction, and maintenance of roads and skid trails to avoid damage to vegetation, soils or wetlands. This is a key area of interest to CARPE implementing partners.

Generally, the production zone will allow most human activities including hunting of species that are not protected, fishing, and gathering of forest products within the limits of national laws. Permanent transformation of the land from forest to non-forest, such as conversion to agricultural land is prohibited.

There may also be discussions about the intended development of processing facilities and manufacture of wood products and other products.

Tasks:
1) *As determined strategically valuable, invest in additional technical capacity to support land management agencies' review and development of measures and management prescriptions central to sustainable timber extraction.*
2) *Likewise, the rules for forest conservation and environmental damage mitigation in production zones should receive additional attention.*

4.3.2 Conservation zone

The conservation zone is allocated to lands needing special management, primarily to conserve biodiversity. Logging is not permitted or severely restricted in these zones. The zone is typically for important wildlife habitats and populations. It can also be applied to areas needed for habitat connectivity throughout the concession. Moreover, conservation zones can be established to protect some semblance of forest structure through conserving patches of forest containing diverse forest structure. Conservation zones can also apply to areas of endemic species; specific high-value habitats such as forest openings (baïs), sacred places, and areas of potential ecotourism; and other areas that require protection from logging operations.

The conservation zone is still open to a variety of uses by the local population including hunting of certain species with specific methods, fishing, and gathering of forest products.

4.3.3 Protection zone

The protection zone restricts logging from sensitive areas such as wetlands, rivers, streams, steep slopes, fragile soils, forest openings, unique habitats, sacred places, and other features that require protection from logging. However, this zone is still open to various uses by the local population including hunting of certain species with certain methods, fishing, and gathering of forest products.

Tasks:
1) *Review and/or help develop the methodology used in identifying conservation and protection zones.*
2) *Develop and/or gather data sets or other argumentation to enable the sound choice of size and location of these conservation and protection zones.*
3) *Provide capacity building, awareness, and implementation support for wildlife management best practices, as possible, based on strategic interests for achieving the landscape plan objectives.*

4.3.4 Community zone

Some countries require community zones while others, such as the Democratic Republic of the Congo, exclude community zones from the concession plan. In both cases, the plan is required to address the needs of the community and, specifically, lands for local community development. This zone is managed to sustain human communities, and expressly allows some conversion of forest to non-forest conditions. The community zone typically occurs where towns, villages, or even small settlements already exist, and allows specific development such as sawmills. The zone may also include areas strictly for the use of indigenous peoples, although as previously mentioned, traditional and customary use and access rights likely exchange for certain practices throughout the concession.

The community zone may be further subdivided into specific areas such as:

- Community forestry (uses of forest land that retain a permanent forest)
- Agro-forestry, or a mix of forest and agricultural uses
- Areas for human occupation and infrastructure

In principle, the concession plan must provide adequate land for community forestry and agriculture for use by local populations and for employees and their families.

These plans also have a program of community development supported by a social agreement addendum to the concession contract (*cahier de charges*). This part of the plan or related document identifies projects for community improvement (often outside the concession boundary). These improvements typically improve local housing, education (schools), health (hospitals, water and sewage facilities), electrification, and programs to secure adequate food sources for the local population. There may also be a section describing research (especially for agriculture) or even a zone for research.

Tasks:

1) *Promote legally recognized community associations that can formally engage with the concessionaire.*
2) *Promote social agreement (cahier de charge) and social programs as tools for sustainable development.*
3) *Review the community zone and other social programs to ensure that the concessionaire provides land and/or direct access to reasonably priced food to allow workers and their families to avoid drawing from the natural resource base for subsistence.*
4) *Monitor implementation of social agreement and programs where strategically valuable and feasible.*

4.4 Plan Implementation and Evaluation

Concession plans also describe plan implementation; monitoring and evaluation, including personnel needs; sequences of management audits; and public participation and education. Generally, implementation of the typical 30-year plan breaks down into smaller management documents.

There is usually a plan (*plan de gestion*) for each 5-year block that identifies species to be harvested, development of the road network, and sequence of harvest, plus other special considerations. For CARPE implementing partners, location of roads and special considerations related to wildlife values within the 5-year block merit particular attention.

The annual area harvest or felling area also requires a plan that must be approved by the government. The annual plan contains a more detailed inventory (exploitation inventory) and details on harvest activities planned for the upcoming year.

The implementation and evaluation section also describes how the concession plan will be enforced and monitored, including verification of the authorized tree cut and volume harvested.

This section also describes controls related to poaching, pollution, and human activities, and describes audits to validate that the plan is being appropriately implemented.

Finally, the plan is evaluated and revised after 5 years.

Tasks:

1) *Gather, review, and comment on information pertaining to road location and special considerations related to wildlife values or other characteristics and objectives outlined in the landscape plan.*
2) *Review the monitoring and evaluation plan and practices and their implementation for important areas and/or resources.*
3) *If the plan has been adopted, gather key information for the ultimate revision of the plan.*

4.5 Economic and Financial Information

Finally, concession plans usually have a summary of expected expenditures and receipts for the first 5 years or longer. This section provides estimates of costs of concession activities in different categories, number of employees needed, and total receipts to be collected, including the portion that will pay government.

4.6 References

For each reference cited in the plan, include author(s) name(s), date, title of article (if applicable), title of publication, publisher (if available), and page(s).

4.7 Other Complementary CARPE Implementing Partner Products

The role of CARPE implementing partners in an ERZ varies from overall technical advisor to contributor on limited elements, to being completely sidelined in the process. Depending on this institutional positioning, CARPE implementing partners could contribute directly to the above elements (4.1–4.4) or in some form of complementary social environmental plan that will ultimately be valuable to the concessionaire, communities, and government partners to support sound management. Additionally, it's important that the previously developed ERZ strategy document be updated periodically to guide interventions as conditions change significantly.

A social environmental plan could include up to three sub-components or plans: 1) wildlife management plan; 2) conservation set-aside plan; and 3) social engagement plan. While the strategy document would include the basic structure and information found in the template.[27]

4.6.1 Social Environmental Plan

Wildlife management plan

A wildlife management plan should describe the ERZ's resources and threats, and specific management measures and guidelines. Key elements of the plan could include:

- An introduction with information concerning the state of wildlife and hunting pressure in the ERZ, and the overarching management objectives. The introduction could include a

[27] USFS/CARPE Strategy Document Template, see http://carpe.umd.edu/Plone/resources/carpemgmttools

summary or referencing of key elements of the legal framework pertaining to wildlife, hunting, and forest concessions.

- Specific management measures or prescriptions to be carried out for sound wildlife management, including but not necessarily limited to, measures pertaining to the company, the workers, and the local communities. The plan could include a map of the hunting areas (may or may not be considered micro-zones) and specific guidelines for what can and cannot occur in each micro-zone.
- Description of the anti-poaching actions and structures planned (objective, institutions involved and roles, staff, training, operational functions, and other aspects).
- Description of the local community's role in participatory or co-management, as well as the monitoring and evaluation elements of the plan.

Best Practices for Wildlife Management in Forest Concessions

Promote partnerships to apply core principles of wildlife management in extractive concessions to:

1) support anti-poaching brigade actions in their zone of influence;
2) effectively control access (24/7) to private concession road networks;
3) provide logistical and subsidized support to assure stable non-game protein sources for workers and, where possible, their families; and
4) support company internal regulations prohibiting hunting during work hours and transport of guns and game in company vehicles.

Example Motivations for Private Sector Investment in These Best Practices

Implementation is relatively low cost and meets multiple objectives:

1) minimize risk by following the law (e.g., lessons from the recent Democratic Republic of the Congo forest title conversion process);
2) establish basic checkpoints and patrols that not only enforce wildlife laws and internal regulations, but also likely more than pay for themselves in controlling other trafficked company property (fuel, spare parts, equipment, etc.); and
3) maintain or generate good international image for continued market access.

Conservation set-aside plan

A conservation set-aside plan could result from analyzing the ERZ's forest environment and include several key elements:

- characteristics and unique features of the proposed set-aside area(s) (forest structure, species present, important habitat, presence of rare fauna or flora, use of zone as a migration route for wildlife, etc.);
- socio-economic situation in and around the proposed set-aside area(s) (communities extracting resources in the zone; ancestral rights in the zone; human movement through the zone; illegal activity in the zone; and level of economic dependence on the zone by locals);
- mapping the proposed set-aside area(s) by identifying sensitive areas in the zone (migration corridors; high level of biodiversity; important water sources running through, or originating in, the ERZ; etc.); and
- implementation strategy and steps to be taken for monitoring and evaluation.

Social engagement plan

A social engagement plan describes how CARPE implementing partners will work with communities to support the realization of the landscape plan's desired conditions and objectives. The plan could include:

- Introduction describing: 1) the communities (stakeholders) that impact or are impacted by the ERZ; 2) ecological, social, and economic information pertinent to the ERZ zone or micro-zone; and 3) the roles, rules, and rights of the company, community, and government vis-à-vis the ERZ (*cahier de charge* process and agreements, taxation, wildlife laws, etc.).
- Description of the engagement: 1) community committee or association and function; 2) general location of the boundaries of the ERZ micro-zones of particular interest to the community; and 3) description of public participation strategy to effectively involve all pertinent stakeholders in participatory or co-management.
- Implementation strategy and steps to be taken for monitoring and evaluation.

Tasks:

1) *As necessary, develop a "Social Environmental Plan" that could include one or all of the three sub-components or plans: 1) wildlife management plan; 2) conservation set-aside plan; and 3) social engagement plan.*

4.6.2 ERZ Strategy Document

A strategy document is a planning tool for elaborating a management plan. It clearly outlines the overall approach CARPE implementing partners take to achieve CARPE planning objectives for each ERZ and what specific activities are needed to complete an ERZ plan. These activities should be measurable and provide a means of verification, along with a timeline for their anticipated completion.

The strategy document should include the following sections, as previously established in the USFS/CARPE template:[28]

1) Identify and define roles of planning team
2) Information/data gathering
3) Creation of a public participation strategy
4) Creation of strategy for formal recognition of plan (or specific components of the plan)
5) Creation of vision and objectives for the ERZ
6) Identify ERZ micro-zones and their associated objectives and guidelines
7) Elaboration of implementation plan for the ERZ
8) Creation of monitoring and evaluation plan for the ERZ

Additional information is provided in the following sections for the guiding elements of the document and associated efforts of the CARPE implementing partners.

Tasks:

1) *Complete and/or update the ERZ strategy document as significant changes occur in the zone.*

[28] USFS/CARPE Strategy Document Template, see http://carpe.umd.edu/Plone/resources/carpemgmttools

Desired Conditions

Desired conditions articulate the broad vision for an area over an extended period of time and set goals for what the area should be, what it should protect, and who it should benefit. Examples could include: 1) The zone will have a fully operational management plan by year XXXX, involving stakeholders in x, y, and z. 2) The company will secure an internationally recognized third-party forest management certification for the ERZ by year XXXX. 3) The forest structure and composition within 5 years of harvest will have reconstituted to deliver critical ecosystem services (wildlife habitat, NTFPs, hydrology, etc.).

Tasks:

1) *Convene strategy team and stakeholders to develop desired conditions for the ERZ(linked to the landscape plan).*
2) *Develop widely shared desired conditions that aim to maintain the zone's unique features and significance, ensure responsible and sustainable management practices on the ERZ, and strengthen the rights of local communities in and around the ERZ.*
3) *State who was involved in developing the desired conditions to clarify whose desired conditions they represent.*

ERZ Objectives:

Objectives are specific accomplishments that indicate measurable progress toward achieving or maintaining the desired conditions. Objectives should be identified for accomplishment in an area within a specific timeframe. It will be important to prioritize objectives based on the context of the landscape (e.g., if 75 percent of the landscape is covered in logging concessions, then you may want to focus on the commercial logging impacts on forest structure).

Examples could include: 1) Provide technical assistance to the logging company to develop a wildlife management plan. 2) Support the extraction company and land management agency to set aside and develop management actions for an important habitat area for gorillas in the ERZ. 3) Maintain healthy quantities and quality of water from the ERZ. 4) Support outreach to local communities about their rights as they relate to the ERZ, and ensure that they are being afforded those rights.

Tasks:

1) *Convene stakeholders for developing ERZ objectives. Multiple objective- setting meetings may be necessary.*
2) *Draft the objectives of the ERZ and, as much as possible, list them in order of priority.*
3) *Describe the opportunities and challenges to achieving each objective.*