A BIODIVERSITY AND BUSINESS GUIDE FOR THE PLANNING, REHABILITATION, DEVELOPMENT, MANAGEMENT AND UTILISATION OF COUTADA 5, SOFALA, REPUBLIC OF MOZAMBIQUE

THE BIODIVERSITY BUSINESS PLAN

FIRST ITERATION, THIRD QUARTER, 2013

AFRICA FUTURA WILDLIFE RESTORATION LDA
REPUBLIC OF MOZAMBIQUE

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Note: This First Iteration of the Plan reflects the *status quo* at the time of writing (August 2013). The document is incomplete as far as certain sections of the contents are concerned. The document will be upgraded and updated as and when the missing information becomes available, which will probably be early in 2014. The document is nevertheless about 95% complete, and it was therefore decided to include it as is in the AFWR/Coutada 5 web page. It should also be noted that all the recommendations and/or actions contained in the plan do not necessarily reflect the final views of Africa Futura Wildlife Restoration Lda, and may eventually not be implemented due to factors such as financial constraints or new information coming to the fore.

NOTES ON MANAGEMENT- AND BUSINESS PLANNING FOR COUTADA 5

1 In choosing a title for this planning document, the seemingly contrasting words ‘biodiversity’ and ‘business’ were intentionally used. A ‘biodiversity management plan’ may be viewed as a working document for the in-perpetuity management of a specific location, in this case Coutada 5. A ‘business plan’ is normally a formal statement of an organisation’s business goals or objectives, and includes an outline for reaching those goals. By incorporating both these seemingly divergent objectives in one plan, the primary objective is to ensure that ‘wildlife’ as personified in the word ‘biodiversity’, as well as the ‘business’ of conservation and sustainable utilisation, inclusive of monetary and socio-economic aspects, are dealt with.

2 It should be noted that this Biodiversity Business Plan (BBP) runs concurrently with an official five-year Management Plan (MP) for Coutada 5, which is currently being compiled, for submission to the Government of Mozambique as per contractual agreement. The Management Plan (MP) is based on the original government approved Proposal for the Utilisation and Management of Coutada 5. Whereas there will certainly be overlap between the two documents (the BBP on the one hand, and the referred-to MP on the other), the MP will be less community-, biodiversity- and rehabilitation related, and will take more of an ‘official’ approach. For example, the MP must adhere to a strict structure and format, as prescribed by the Government of Mozambique. The BBP, on the other hand, should be viewed as mainly an extensive in-house company guide, which will also be made available to prospective donors or donor agencies. Notwithstanding these differences, all the plans, irrespective of their origin, will adhere to the same set of principles.

PREAMBLE

AN IMPOSSIBLE DREAM?

The dreamer, the idealist if you wish, has the capacity to day dream about vague and often nebulous matters in his life. He can dream about being rich, or about becoming the best in his field. Or he may visualise himself as a famous sportsman. Or as strolling down a sun-drenched beach, somewhere in the tropics, with a blonde maiden on his arm. Such idealistic dreams, however, are often just that: the dreams of an idealist. Reality does not play a role in such dreams, because they forever remain just that: an impossible dream.

THE REALIST'S DREAM!

Then, inevitably, the question arises: how then is it possible that, sometimes, dreams are indeed coming true? A dream should after all be just that: a dream. An impossible dream! However, if one does not dream anymore, you have given up on life. But, and herein lies one of the greatest privileges of being a human being, sometimes a seemingly impossible dream is dreamt by a realist. Such a dream is the stuff that defines a human being from a lower intelligence: a *realist can and should have dreams! A realist should also be an idealist!* In Coutada 5, in the year 2013, such a realistic idealist's dream started taking shape. A new concession was applied for – by Oliver Wettstein, a young Swiss businessman, hunter and nature lover who made Africa his home, and his father, Urs Wettstein: two idealists with a realistic dream. Oli dreamt that the almost 700 000 ha of virtually pristine African woodland entrusted to his care, could be developed in such a way that his dream would indeed come true: a wilderness area where man and beast can live in harmony; where the wildlife that once roamed this beautiful piece of land, may be reintroduced; where generations to come could indeed say with pride: this idealist's dream was indeed the dream of a realist!

CREDO OF AFRICA FUTURA WILDLIFE RESTORATION LDA

The Government of the Republic of Mozambique entrusted custodianship of Coutada 5, an officially protected area of 687000 ha in Sofala province, to Africa Futura Wildlife Restoration Lda (AFWR), the holding company. Realising the responsibility that goes with custodianship of such a large tract of land, AFWR undertakes to treat the land, inclusive of all the current and future biodiversity resources as well as all the human role-players, with all due respect, and thus to ensure that Coutada 5 will be developed, managed and utilised in an ethical and environmentally friendly manner, to the benefit of all concerned, and in line with Mozambican laws and policies.

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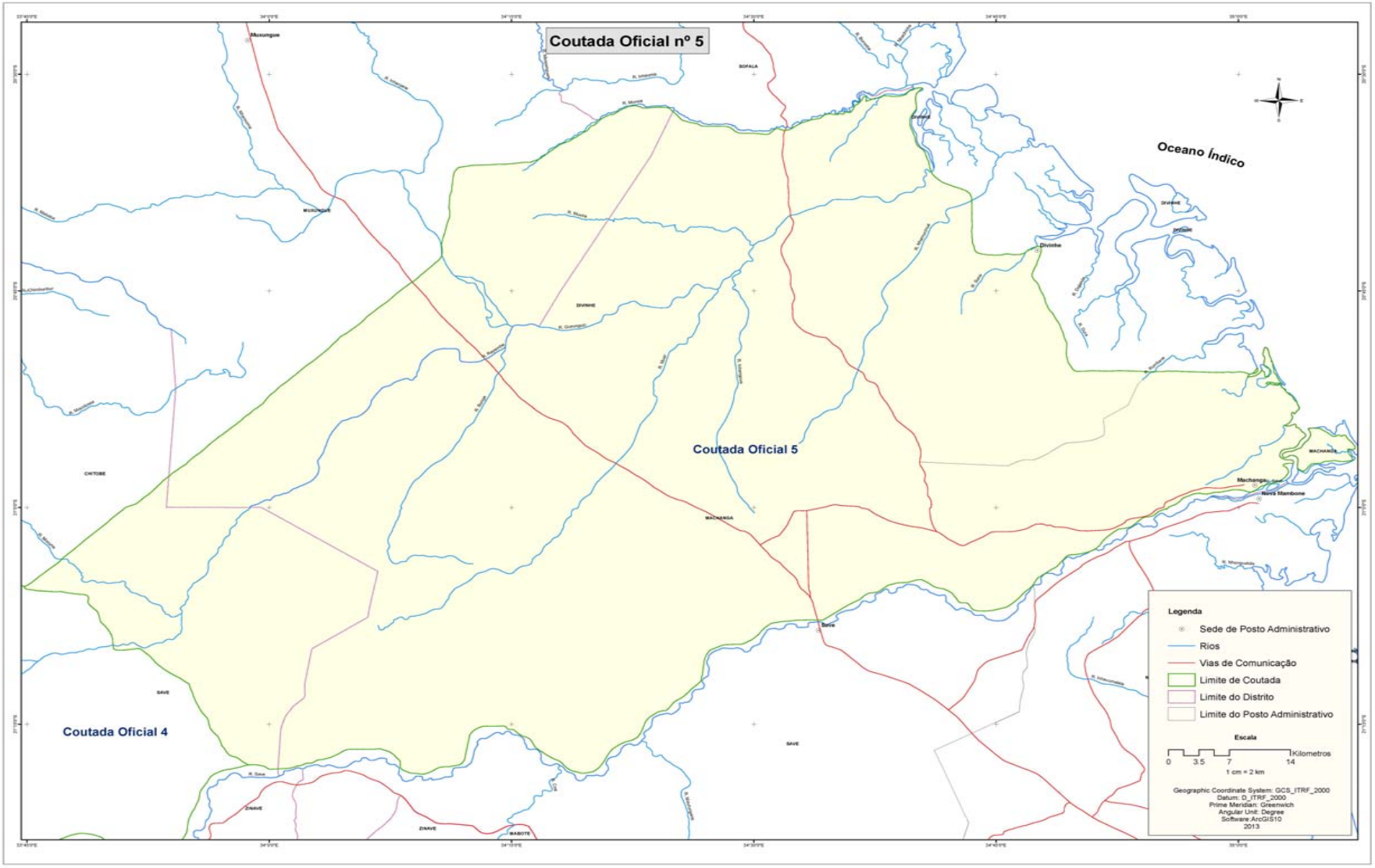
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EXECUTIVE SUMMARY

BIODIVERSITY BUSINESS PLAN

The Biodiversity Business Plan for Coutada 5 reflects a complex set of interwoven historical, legal, biodiversity, social, development and management factors, and is thus inevitably a complex document. This Executive Summary therefore does not try to condense the diversity of aspects that are dealt with, but rather only highlights certain of the most pertinent principles.

The Biodiversity Business Plan (BBP) is part of a dynamic process and reflects the planning objectives at the current time. As such the plan will be able to cope with the principle of adaptive management, whilst still providing answers to the questions of *what* management actions are to be undertaken, *why* these actions are deemed necessary, and, albeit to a lesser extent, also to the question of *how* the project objectives will be realised.

THE PROJECT

There are currently 12 operational Coutadas, or Wildlife Management Areas/ Controlled Hunting Areas in Mozambique, of which Coutada 5 at 687 000 ha is the largest. The Government of Mozambique allocates the Coutadas to suitable applicants on a leasehold contract basis. These contracts make provision for the development and management of the Coutadas, without ownership being granted to the concessionaires. The contract for Coutada 5 was granted in August 2012 to the holding company, *Africa Futura Wildlife Restoration Lda* (AFWR) on a 20 year lease, thereafter renewable in segments of five years each. Since Mozambique, notwithstanding encouraging and sustained economic growth, still ranks 184 out of 187 countries on the human development rank, the contract stresses the need for economic development and socio-economic upliftment of the local communities. In order to comply with these contractual requirements, AFWR accepted and applies the policy of community-based natural resources management.

VISION AND OBJECTIVES

The mission for Coutada 5 is as follows:
“To plan, develop, manage and utilise Coutada 5 in such a manner that the seriously depleted biodiversity resources will be rehabilitated over time, and in line with relevant Mozambican laws and policies, thus allowing sustained consumptive and non-consumptive use of these resources, whilst at the same time pursuing sustainable agricultural developments on certain sections of the Coutada, and simultaneously acknowledging the need to involve the local communities in a positive, meaningful and mutually beneficial manner.”

The diversity of the project objectives is a reflection of the complexity of what needs to be done and of the magnitude of the venture. A total of five biodiversity-based conservation objectives, four sustainable use objectives, one each of tourism and social objectives, four fiscal and administrative objectives and two collaboration objectives were identified. These objectives are directly based on the corresponding national objectives for Mozambique.

THE BIODIVERSITY CONTEXT

Whilst empirical data is lacking, it seems from anecdotal evidence and published books that Coutada 5 used to be a veritable wildlife paradise during the period of Portuguese supremacy. However, during the protracted civil war following on the withdrawal of the colonial power, civil order collapsed and the biodiversity resources of Coutada 5 were unsustainably utilised to such an extent that virtually all the major herbivore and carnivore species became extirpated. The unsustainable utilisation of renewable natural resources continues to this day. Relic populations of impala, kudu and nyala, as well as small populations of smaller antelope such as suni and oribi, still occur. The species that were exterminated include lion, elephant, buffalo, sable antelope, Lichtenstein's hartebeest, eland, plains zebra, blue wildebeest, reedbuck and waterbuck. Hippo and crocodiles can still be found in the Rio Save, albeit in diminished numbers.

However, the diversity of habitats escaped largely unscathed, except for the long-term negative impacts arising from frequent and uncontrolled veldt fires that take place annually. These habitats include sizeable mangrove swamps along the Indian Ocean coast, a number of intertidal salt marshes, dambos to the landward side of the marshes and the mangroves, and a mosaic of vegetation types. The more important vegetation types include Mixed Deciduous Woodland (extensive), Mopane Woodland/scrub (extensive), Riparian Woodlands (limited), Grassland/Hyphaene Palm Savannah, (extensive), Miombo Woodland with Thickets (relatively restricted but often locally prominent), and also Thickets, including *Androstaychys johnsoni* thickets, Mixed Deciduous Thickets, and Rocky Outcrop thickets.

Avifaunal and herpetofaunal surveys have not been completed yet, but it seems as if in both instances the species richness and numbers of animals are unexpectedly depauperate. Anthropogenic influences, such as frequent fires and other man-made disturbances, may be the reasons behind this situation.

The condition of the grazing for herbivores varies according to soil types and the local frequency of man-induced fires. In the almost total absence of grazers, the quality of the grazing deteriorated due to underutilisation, but can nevertheless be classified as between good and even excellent. The carrying capacity for herbivores has provisionally and conservatively been calculated as 1 LSU/16 ha (LSU = Large Stock Unit)

An extensive (possibly the largest in the world) wildlife re-introduction program will be launched. This program will meet with all the relevant international norms, policies, definitions and standards, including all the listed biological, sociological and legal requirements. The to-be-relocated list includes 20 species, ranging from the elephant and buffalo down to the suni and oribi. Based on the above LSU carrying capacity of 16 ha/LSU, the planned 210 000 ha wildlife-wilderness block can accommodate an impressive total of 3 125 LSU's.

The state of the conservation of the country's biodiversity resources in Mozambique is not good. Though protected areas (Coutadas included) constitute about 16% of the total area, most of the protected areas have suffered from human encroachments and the resulting decline in wildlife numbers. The country drew up a comprehensive Strategy and Action Plan for the rehabilitation

and conservation of biodiversity. This Plan lists eight conservation objectives (with four relevant to Coutada 5), and nine sustainable utilisation objectives (with six being relevant to Coutada 5). In the case of Coutada 5 the realisation of these objectives are threatened by the bush meat menace (illegal hunting), human settlements, extensive wood fuel harvesting, and the illegal logging of hardwood species.

With regards to the floral component, conservation and management priorities will be aimed at identifying and managing special preservation areas, fire management, and establishing photographic monitoring points.

The conservation and management of the terrestrial fauna will centre on a comprehensive wildlife re-introduction program. This program will strive to establish and maintain viable free-ranging populations of herbivores and carnivores, which in turn will lead to the necessity of population control. Such control will include trophy hunting as the mainstay of economic use, and the removal of excess game by means of culling and live capture. In order to contain, manage and protect the expensive and scarce relocated species, the erection of a game-proof electrified fence around the planned core wildlife-wilderness area of 210 000 ha will be an imperative. The matter of ownership of the re-introduced wildlife will need to be cleared with the government. The Terrestrial Wildlife Sustainable Utilisation Plan entails three modules: firstly establishing the core wildlife-wilderness area (11 steps), secondly the establishment and utilisation of herbivores (also 11 steps) and lastly the establishment and utilisation of carnivores (a nine step procedure). The plans for the three modules provide a broad range of guidelines, with, in most instances, implementation requirements.

THE AGRICULTURAL CONTEXT

In Mozambique agriculture remains one of the mainstays of the economy, with a 21,1% contribution to the Gross Domestic Product. Mostly low-yield outdated production techniques are employed. About 96% of agricultural production takes place on smallholdings, with the result that stimulating smallholder agricultural production has been identified as a major focal point. The situation in Coutada 5 reflects the national scenario with regards to production, although it is highly likely that the great majority of people living in the Coutada are either entirely, or to a major degree, dependent on agriculture for their daily livelihoods. Agricultural development will thus be one of the priority objectives of the company, taking into consideration no less than nine factors that will inhibit the success of such a development.

The overall agricultural development vision for the Coutada can be defined as follows:
“To create an enabling environment, to provide the required inputs and to develop institutional arrangements, in order to establish a local agricultural industry to generate sustainable socio-economical livelihoods of the present community in the project area, and to provide viable livestock ranching opportunities for investors.”

The sustainable agricultural development plan will be implemented in four phases, and the first two phases involve a 14-point implementation procedure. The pertinent role of the local communities, being essentially the ‘owners’ of the plan, in the execution of the plan is stressed. Provision is also made for agricultural investors, specifically cattle ranchers, to become involved

in the Coutada. Such an involvement will lessen the huge financial burden emanating from the expensive wildife re-introduction program.

THE ECOSYSTEM RESTORATION PLAN

The purpose of the Ecosystem Restoration Plan (ERP) is in line with the overall mission of Coutada 5, and is therefore compatible with the purpose and objectives of the international Convention on Biodiversity, and finally with the objectives of Coutada 5:

"To plan, develop, manage and utilise Coutada 5 in such a manner that the seriously depleted biodiversity resources will be rehabilitated over time, and in line with relevant Mozambican laws and policies, thus allowing sustained consumptive and non-consumptive use of these resources, whilst at the same time pursuing sustainable agricultural developments on certain sections of the Coutada, and simultaneously acknowledging the need to involve the local communities in a positive, meaningful and mutually beneficial manner."

The ERP considers all the contexts within which ecosystem restoration will have to take place: the biodiversity and conservation-, the wildlife re-introduction-, the social-, political and administrative- and finally the developmental and operational contexts. The ERP embodies seven steps.

THE SOCIAL CONTEXT

The development of Coutada 5 will take heed of the needs and aspirations of the people living in the Coutada. Most of the estimated 50 000 plus people living in the Coutada reside in the major coastal towns or settlements of Machanga and Divinhe, and the settlement at Jofane about 100 km upstream next to the Rio Save. The more remote regions, constituting some 85% of the Coutada, are only sparsely settled.

Whilst almost all of these people will directly or indirectly benefit from the current re-establishment process of Coutada 5, for obvious reasons the development company will need to concentrate on the rural communities inhabiting the more isolated regions. These people will gain most by the development of the Coutada (employment opportunities being their main advantage), but unfortunately those currently living in what will soon become the core wildlife-wilderness zone, will have to be resettled.

Any involuntary resettlement program is fraught with dangers; therefore AFWR will deal with the matter in a sensitive, transparent and universally acceptable manner. International norms and prescriptions, especially those of the IFC/World Bank, will be applied throughout the process. In order to ascertain the exact social situation on the ground in the core wildlife-wilderness block, a full Social Impact Assessment is currently underway. This survey is based on in-house experience available to AFWR, as well as numerous published data.

In the meantime, social indicators, social obligations, the effects of the fencing and game re-introduction schedule, and some key social strategies were evaluated. An analysis of the socio-economic impacts of the project indicated that of the two possible scenarios, namely a 'no project' or an 'as is', the 'as is' venture will not only be beneficial in the biodiversity context, but

perhaps even more so when viewed from a social perspective. The project will generate a large number of employment opportunities in a very poor and undeveloped region where such opportunities were virtually absent, and the planned tourism ventures (including hunting and non-consumptive ecotourism) will be beneficial to the whole region.

The comprehensive Resettlement Action Plan (a 21-page section) is directly compatible with international requirements, involves a 14-point procedure, and is built on the evaluation and/or inclusion of the following aspects: resettlement principles; ceded land; compensation; preferential employment; resettlement-related impacts (such as policies, establishing the scale of the resettlement; location of the resettlement sites; public consultation requirements; and compensation issues); impacts on livelihoods; impacts on customary resource use; impacts on agricultural practices; and impacts on trade and the local economy.

Following on the RAP, an equally comprehensive Community Development Plan (CDP) involving eight implementation steps, has been prepared. The CDP is built on the prioritising of target groups, and on identifying the roles of the company and the local people in the process. A major constituent of the CDP is the creation of a Community Development Fund, to be administered by the to-be-established Coutada Community Trust.

In order to give effect to the various sub-plans contained in the Biodiversity and Business Plan, a full-blown Public Consultation and Disclosure Plan (PCDP) will be implemented. The seven steps of the PCDP include the establishment of an organisational framework, identification of all the stakeholders in the process, identifying the contents of the PCDP, embarking on an effective consultation and information campaign and drawing up an implementation schedule.

TOURISM AND CONSERVATION INITIATED OPPORTUNITIES

Interdependency between conservation, utilization and benefit sharing has been established from the onset of the Coutada 5 project. The commercial activities that will take place on the Coutada should pave and pay the way for the conservation of the biodiversity resources, whilst at the same time being totally dependent on maintaining (or establishing in certain respects) a healthy environment and the goodwill and support of the local communities. The commercial development of Coutada 5 may impact in a number of ways on the environment on which it depends. Tourism and tourism-related activities are thus inseparable from the biodiversity resources.

The general primary and secondary objectives for sustainable ecotourism development in the Coutada can be summarized as follows:

“The primary objective of sustainable ecotourism development is to develop ecotourism facilities and activities within the Coutada that are both sensitive to a biodiversity-rich ecosystem and beneficial to the conservation of the ecosystem, as well as forming a basis for financial self-sustainability. A secondary objective is to assist in ensuring that the rapidly expanding ecotourism developments in the northern areas of Mozambique are also environmentally sustainable.”

More specifically, the tourism development objectives can be defined as follows: firstly to develop a biodiversity friendly strategic tourism development plan which will establish a set of principles, frameworks and mechanisms on which the ecotourism development will be based, and secondly to review tourism-based current and prospective community benefit-sharing and make recommendations for its maximization.

The Sustainable Tourism Development Program is based on four modules: Module 1 entails a 9-step sustainable tourism development plan, module 2 highlights possible regional institutional tourism developments, module 3 provides for codes of practice and module 4 designs an interpretation program.

The project will contribute to the general economy of the region in various ways. Tourism will create opportunities during the construction phase of facilities, and during the operational phase (primarily employment opportunities, but also a variety of entrepreneurial possibilities). Furthermore, obligated payments to the Community Trust Fund will be available for distribution. The establishment of the wildlife-based industry in the core wildlife-wilderness block will create a host of advantages, financial and otherwise, to the local project-affected people.

ECONOMIC ISSUES

Initial calculations indicated that AFWR would find it virtually impossible to carry all the expenses emanating from the rehabilitation and development of Coutada 5. The rehabilitation costs are calculated to be US $32,6 million, of which the major portion would be the rehabilitation of the denuded wildlife populations. Annual operating costs will run to an estimated US $450 000, giving an operational deficit of some US $140 000. This rather bleak forecast indicate that the break-even point may be reached in year six, at which time the cumulative deficit will be in the order of US $840 000. Measured against this loss, however, must be firstly the scope and national importance of a successful wildlife rehabilitation program, and the monthly income boost of US $27 000 to the local project-involved people. These figures are unheard of not only locally, but also in the whole region. The successful development of the Coutada 5 project, will thus have a hugely beneficial impact on the local economy. AFWR hopes to attract donor assistance to pay the way to get the challenging but ultimately highly deserving project off the ground.

ADMINISTRATION

The administration and administrative management of Coutada 5 provide for the establishment of a staff structure. The role and mission of the staff establishment is such that it will facilitate the execution of the Coutada's objectives:
"To ensure the effective conservation of the terrestrial and freshwater resources by means of low intensity, rigidly controlled and environmentally sensitive commercial development to the benefit of the local communities, investors, and the broader region., and to ensure that the development guidelines of the BBP and its associated subordinate plans, are effectively implemented and all the project objectives are ultimately realized"

To effectively serve the interests of the local communities, a number of formal structures are in the process of being established, namely a Government Liaison Committee, and three community structures: the overarching Coutada Community Trust, the Coutada Community Conservation Committee and the Coutada Community Agricultural Committee.

Personnel management will take place according to Coutada Standing Orders and a Coutada Staff Code. A preferential employment policy, in favor of the local people, is implemented. Other aspects dealt with are staff training, capacity building, waste management, security and law enforcement, health management and finally financial management.

ZONING

The zoning plan for a protected area such as Coutada 5 establishes the framework for management, and is normally the primary document from which the management plan is derived. In Coutada 5 zoning will apply to all activities occurring within the Coutada, and thus appears in the management plan to guide the way in which the area will be managed. Most conservation authorities, AFWR as a private company included, adhere to a strict zoning regime and use zoning firstly as a framework for specific planning, and secondly to facilitate management decisions on the use and development of their protected areas.

The zoning system for Coutada 5 is based on especially the Parks Canada system, with elements of other African zoning systems and plans included. The Parks Canada system provides for five zone classes, but obviously makes no provision for any agricultural ventures, as will be the case for Coutada 5. The Coutada 5 system therefore includes not only the ‘normal’ five biodiversity-based conservation zones, but also an additional four agricultural and one towns/settlements zone. The major zones include the core wildlife-wilderness zone of about 210 000 ha, the future cattle ranching blocks totalling 100 000 ha, and a multiple-use community zone of more than 300 000 ha.

ACRONYMS

AFWR	Africa Futura Wildlife Restoration Lda
BBP	Biodiversity Business Plan
BD & C	Biodiversity and Conservation
CBNRM	Community-based Natural Resources Management
CBD	Convention on Biological Diversity
CCCC	Coutada Community Conservation Committee
CCAC	Coutada Community Agricultural Committee
CCT	Coutada Community Trust
CDF	Community Development Fund
CDP	Community Development Plan
CHA	Controlled Hunting Area
CIO	Conservation Initiated Opportunity
CMC	Coutada Management Committee
CSC	Coutada Steering Committee
CSD	Centre for Sustainable Development
CSO	Coutada Standing Orders
CTC	Community Trust Committee
CTF	Community Trust Fund
CRC	Community Resettlement Committee
ESU	Economically Sustainable Use
EIA	Environmental Impact Assessment
ERP	Ecosystem Restoration Plan
FAO	Food and Agricultural Organization
FRSUP	Freshwater Resources Sustainable Utilization Plan
GLC `	Government Liaison Committee
GDP	Gross Domestic Product
GM	General Manager
GoM	Government of Mozambique
GSC	General Staff Code
ICAM	Integrated Coastal Area Management
LAC	Limits of Acceptable Change
MICOA	Ministry for the Coordination of Environmental Affairs
MRSUP	Marine Resources Sustainable Utilization Plan
MURPA	Multiple-use Resource Protected Area
PARPA	Poverty Reduction Plan
PCDP	Public Consultation and Disclosure Plan
PPPAP	Public Private Partnership Action Plan
PPP	Public Private Partnership
RAP	Resettlement Action Plan
RCAP	Regional Conservation Action Plan
RM & E	Research, Monitoring and Evaluation
SADP	Sustainable Agricultural Development Plan

SAP	Strategy and Action Plan
SBSR	Social Benefit Sharing and Responsibility
STDP	Sustainable Tourism Development Plan
SUSAP	Sustainable Agricultural Plan
TWSUP	Terrestrial Wildlife Sustainable Utilization Plan
TFCA	Transfrontier Conservation Area
UNCED	United Nations Conference on Environment and Development
USNPS	United States National Parks Service
VCWS	Vilanculos Coastal Wildlife Sanctuary
VIM	Visitor Impact Management
WMA	Wildlife Management Area

ACKNOWLEDGEMENTS

This document is authored by A von W Lambrechts, in his capacity as Chairman of the Management Committee for Coutada 5, where he has been specifically tasked to prepare all the plans for the Coutada. The following persons contributed directly to the preparation and compilation of the Biodiversity Business Plan, and they are thanked for their valuable inputs:

- Prof Dr Piet du Plessis
- Dr Niels HG Jacobsen
- Mr André E Engelbrecht

Furthermore, thanks is due to the two principals of the project, Urs and Oli Wettstein, for having the vision to create a ‘new’ and rehabilitated Coutada 5, and for the opportunity granted to the abovementioned specialists to become involved with such a demanding but ultimately extremely satisfying project.

INTRODUCTION

Coutada 5 in southern Sofala province of the Republic of Mozambique, is an official protected area of some 687 000 ha or 6 870 km². During and immediately after the protracted civil war of the 1980's and the early 1990's, the erstwhile abundant wildlife of the Coutada was exploited to the point of local extinction of most species. All the major herbivores and carnivores disappeared from the Coutada during the time when civil order collapsed, and an unknown number of people moved in to settle the vacant land. Despite this catastrophical decline in wildlife numbers, the variety of wildlife habitats in the Coutada survived mostly intact. If one looks beyond the depauperate state of especially wild herbivores and carnivores, there is still huge potential to rehabilitate the Coutada and to restore the wildlife to their former glory.

A private Mozambican company, Africa Futura Wildlife Restoration Lda (AFWR) applied for, and was granted, the concession for Coutada 5 by the Government of Mozambique in late 2012. The company then embarked on an ambitious program to try and rectify the mistakes of the past, and to turn around the negative impacts of the past excesses. The rehabilitation program will be built on two major long-term objectives: firstly to restore the wildlife and secondly to contribute to the socio-economic upliftment of the poor rural people inhabiting the Coutada.

AFWR regards the proper planning of the expensive venture as a non-negotiable. The planning process started with the compilation of a mandatory Five Year Management Plan, submitted to the government for approval, followed up by this more detailed and comprehensive document.

The rehabilitation of Coutada 5 and the concomitant wildlife restoration program, will entail one of the biggest conservation projects currently underway in Africa, and may even be the most expensive and ambitious conservation program ever undertaken by a private company anywhere in the world. After establishing a fenced core wildlife-wilderness area of more than 2 000 km², a comprehensive range of herbivores and carnivores is expected to be re-introduced to this area over time. This huge restoration program, during which more than four thousand animals will need to be re-introduced, will largely depend on enough game becoming available in sufficient numbers, to be captured and transplanted to the Coutada. Most of the game earmarked to be re-introduced, will probably come from outside the borders of Mozambique. The logistics of such an operation speaks for itself.

The second major objective of the development of the Coutada hinges on a number of social projects. Some households currently living in what is to become the core wildlife-wilderness area, stocked with big game, will have to be resettled to other areas zoned for community development. The Company will strive to deal with involuntary resettlement in such a fair and sympathetic manner, that the process will be completed amicably and to the benefit of all role-players. It is furthermore the stated intention of AFWR to assist the smallholder farmers to move away from the ecologically destructive and low-yield slash-and-burn cultivation practice, and to embrace more modern organic farming methods.

FORMAT AND STRUCTURE OF THE BIODIVERSITY BUSINESS PLAN AND THE PLANNING PROCESS

It should again be noted that the development and rehabilitation of Coutada 5 take place according to the provisos and guidelines of two management plans: this document with a more detailed in-house approach, and the 'official' Management Plan (MP) which will be submitted to the Government of Mozambique as a contractual obligation. Both plans, however, embody the same principles and, broadly speaking, outline the same objectives.

It is normal for the compiler/editor of especially an extensive biodiversity management plan, such as this document, to include references at the relevant portions of the document. However, for practical reasons this 'normal' procedure has not been adhered to. This proviso notwithstanding, every effort has been made by the author/editor, to ensure that broad statements, information quoted, references to the national and international scenes etc contained in the plan, are as accurate as humanly possible. However, notwithstanding this proviso, a general list of published sources used in the compilation of this plan, is attached hereto as an addendum.

Whilst the format of the Biodiversity Business Plan (BBP) that follows is loosely based on the planning document guidelines of the KwaZulu-Natal conservation agency in neighbouring South Africa (Ezemvelo KwaZulu-Natal Wildlife), the various similar plans compiled/edited by the author of this document for two World Bank projects in Lesotho, and the Vilanculos Coastal Wildlife Sanctuary on the San Sebastian/Quewene Peninsula to the southeast of Vilanculos in neighbouring Inhambane province, served as specific guides. Obviously, since the mission and objectives of no two areas are alike, the layout and contents of the document was adapted to suit the local Coutada 5 situation.

The planning of a protected area such as Coutada 5 is a dynamic process that merely reflects the state of the environment, and thus the planning objectives, *at the specific time*. It is imperative that the plan must be able to accommodate the principle of *adaptive management* that will be applied to the management of the biodiversity of Coutada 5, and will need to provide a description of ***what*** managements are to be undertaken, as well as the reasons ***why*** they must be done. Planning should take place within the context (*"where are we now?"*) and the vision (*"where do we want to be")* for the protected area, and should provide answers to the basic question of "*how are we going to get there*".

Any plan aimed at assisting in adaptive management should therefore be able to constantly adapt to changes in the biophysical, the socio-economic and the cultural environments within which it was originally drafted. The comprehensive guidelines laid down by the IUCN to evaluate management effectiveness, also apply *situ situ* to the planning process and have been applied to this document wherever possible and necessary.

Unfortunately, the almost universal problem facing protected area planners, namely the need to avoid the tendency of over-enthusiastic planning leading to cumbersome and complex plans that are difficult to implement, could, even in the case of a privately-driven enterprise such as Coutada 5, not be fully avoided. The complexity of both the physical environment and the

biodiversity resources of the Coutada, linked to the fact that no baseline research or planning has ever been undertaken in the area, the divergent proposed uses of the natural resources, the comprehensive requirements that must be met to possibly qualify for donor assistance, and the far-reaching social impacts of the project, necessitated a more comprehensive BBP with more follow-up work than would have been the case under ideal conditions. But then, an ideal situation only exists in a fictional project!

A multidisciplinary approach was followed during the planning process. Highly experienced specialists were contracted to undertake the necessary base-line surveys and to submit reports relevant to their respective terms of references. The fieldwork phase of the planning process started in late April 2013, and especially the fieldwork phase for the various operational/implementation plans that will need to be compiled (see below), will probably carry on intermittently for a considerable number of years. Unfortunately financial and time constraints severely handicapped the ability of the specialist planners to undertake full surveys. However, this shortcoming is not seen as a real negative, primarily because some of the members of the initial Management Committee of the project, have far- reaching and quite extensive planning and managerial experience. Less extensive planning surveys will in future be undertaken on a routine basis, especially when revisions of this BBP and the various operational or implementation plans are undertaken.

The planning process itself adhered to universally accepted norms and procedures. Terms of references were drawn up for each base-line study, and each of the contracted planning specialists had full scientific license and freedom of expression with regards to his/her activity.

I addition to this first tier BBP, a series of second level Operational Plans/Policies (OPs) will be prepared for certain of the principal management operations or tasks. The OPs will contain detailed but concise prescriptions on ***how*** these management actions will be dealt with, and will, where applicable, list the actions to be undertaken annually. OPs will be concise documents, containing only essential data relevant to the specific topic. These to-be-compiled plans/operational documents are identified in the appropriate sections in the text of this BBP. Indeed, some of these OP's may even precede the finalization and approval of the full BBP. The BBP and the subsidiary OPs will be working documents that will endeavour to provide operational and management guidelines during the development stage of the project.

Given the primary conservation objectives of the Coutada system in Mozambique (see below), the BBP obviously concentrates on biodiversity matters. Other topics such as all the activities and plans relating to agricultural projects, social impacts, social actions, tourism, educational programs and the economical analysis, to mention but a few, have nevertheless been included in the BBP, albeit in a somewhat condensed format, in order for the global picture to emerge. These "peripheral" topics, whilst not strictly speaking related to biodiversity, would all have a direct influence on the conservation and management of the biodiversity resources of Coutada 5, and indeed on the very existence of the Coutada, and could therefore not solely be dealt with in separate documents.

MOZAMBIQUE AT A GLANCE

The development and rehabilitation of Coutada 5 can not take place in isolation. Indeed, due cognisance will have to be taken of the current and predicted future scenario in Mozambique with regards to politics, socio-economic concerns, finances, economic realities, gross domestic product, trade, natural resources and government policies, to mention but a few.

The following data provide a multi-disciplinary background to Mozambique (2011 figures):

Area: 802 000 sq km
Population: 23,9 million
GDP per capita: US $800
GNI per capita (Atlas method): US $480 (Sub-Saharan Africa = US $1,258)
GNI (Atlas method): US $11,1 billion
Annual growth rate: population 2,4%
Annual growth rate: labour force 2,3%
Infant mortality: 142 per thousand births
Life expectancy: 50,2 years
HIV and AIDS rate: 11,5%
Literacy rate: 55,1%
No access to safe water: 44,1% of households
International human development rank: 184 (out of 187)
Global hunger rank/index: 65/22,7
Structure of the economy (% of GDP):
- Agriculture: 29,8% (declined from 39,1% in 1991)
- Industry: 23,0% (increased from 14,6% in 1991)
- Services: 47,2% (46,2% in 1991)
- Annual growth agriculture: 8,7% (up from 5,8% in 1991)
- Annual growth industry: 7,6% (15,4% in 1991)

Trade: total exports: US $2,656 million
Trade: total imports: US $4,465 million
Donor aid and government expenditure: 2012 donors promised 41,4% of expenditure; delivered just 27%

In summary, it is clear that notwithstanding encouraging growth of the economy during especially the last decade, Mozambique is still a very poor country. No full-scale socio-economic survey has been undertaken in Coutada 5, but the local situation would probably be at an even lower level than the abovementioned averages of the country.

PART A: LEGAL STATUS AND POLICIES

CHAPTER A1: LEGAL STATUS

1.1 OFFICIAL PROCLAMATION

Coutada 5 was gazetted (by decree 592/72) as a Wildlife Management Area WMA (Controlled Hunting Area CHA) on May 30, 1972. As such it shares the status of a WMA with the other Official Coutadas in Mozambique, and thus constitutes, with Transfrontier Parks, Transfrontier Conservation Areas (TFCA's), National Parks and Reserves, an important link in the chain of formally protected areas in the country. The current contract with the Government of Mozambique was signed in August 2012, granting usufruct rights to AFWR for a period or 20 years, renewable for further cycles of 5 years, provided that AFWR performed in accordance with the provisos of the contract with the government, and the five-year Management Plans.

1.2 CONTRACT BETWEEN AFRICA FUTURA WILDLIFE RESTORATION LDA AND THE GOVERNMENT OF MOZAMBIQUE

The contractual agreement between the Government of Mozambique (GoM) and AFWR, is a legally binding document that outlines AFWR's rights and obligations with regards to the development, rehabilitation and utilization of Coutada 5. The general and specific provisos of the contract must thus be heeded, and the impact thereof on all the planning activities, and subsequently also on the operations of Coutada 5, must be considered.

The contract can be summarised as follows, with, where applicable, the impacts and consequences of certain clauses of the contract briefly described. Some clauses that will have no direct bearing on the compilation of this BBP, and/or the future development of Coutada 5, such as purely administrative or contractual stipulations, are not included in the summary.

CLAUSE	CONSEQUENCES AND IMPACTS
1.1 The rights to exploit, develop and conserve are granted, the objective being to offer safari hunting and ecotourism activities 1.2 Other activities or practises of exploitation, development and conservation of natural resources may be motivated by AFWR and approved by government 1.3 AFWR may not enter into any sub-contracts with regards to exploitation, development and conservation 1.4 Any transfer of hunting rights to other operators, will require the written permission of the GoM	1.1 Is in line with the AFWR philosophy 1.2 AFWR will motivate for other compatible activities to be allowed, eg. agriculture (livestock ranching, and possibly cultivation of crops under irrigation) 1.3 The severely depleted status of the biodiversity resources will make any sustainable use impossible, and the inevitable rehabilitation of Coutada 5 will be extremely expensive; AFWR will thus have to solicit assistance in the form of investors (both with regards to wildlife ranching and livestock ranching) 1.4 AFWR has no option but to involve

	other hunting operators. Such operators will mostly utilise wildlife resources that were re-introduced to the Coutada at great expense, and that were subsequently controlled in game proof enclosures. The question of 'ownership' of such resources, and the need to obtain written approval prior to other operators becoming involved, may have to be taken up with the GoM.
3.1 The original contract is valid for a period of 20 years, and may be renewed for further 5-year cycles, provided that AFWR has fully complied with all the contractual conditions	3.1 The 5-yearly renewals will be based on compliance of AFWR with all the contractual requirements, particularly with respect to fencing, wildlife re-introductions, wilderness trails, access roads, an airstrip, infrastructure, tourist facilities and various community projects.
4 The **rights** of the GoM are as follows: 4.1(a) The GoM may supervise and inspect compliance with the approved plans and laws, and may provide assistance with regards to the control of activities that may interfere with AFWR's hunting and related activities 4.1(b) The GoM may authorize, but also prohibit, the hunting of species in Coutada 5, and may implement specific hunting regulations 4.1(c) The GoM must set annual hunting quotas, at least six months before the onset of the hunting season 4.2 The **obligations** of the GoM are as follows: 4.2(a) The GoM may not grant rights to a third party that may impede on the rights of AFWR 4.2(b) The GoM must approve the 5-year plans and annual activity of AFWR, provided that they are submitted in accordance with Clauses 7 and 8, and within the timeframe stipulations 4.2(d) The GoM must provide advice, technical recommendations and information (as and when needed?) 4.2(e) The GoM must provide permits (for hunting etc) timeously 4.2(f) The GoM is obliged to 'promote' the training of supervisors and guards, at the expense of AFWR	4.1(a) AFWR may need such assistance, and should use the opportunity 4.1(b) The question of 'ownership' of reintroduced wildlife again arises, with the GoM in a position to set, and by implication also veto, annual hunting quotas 4.1(c) This proviso may, in practise, lead to delays and marketing problems for AFWR 4.2(a) This obligation will safeguard the Coutada from for example hard-wood logging 4.2(b) AFWR will have to adhere to the set-down timeframes, as well as to the provisos of clauses 7 and 8 4.2(d) Such a GoM service is probably not mandatory 4.2(e) Such a proviso may lead to inadvertent delays, and administrative problems 4.2(f) Such a GoM service is probably not mandatory
5 **Rights** of AFWR 5.1(a) The rights to exploit Coutada 5 under the terms of the contract, with the use of non-mentioned activities being forbidden unless prior written approval from the GoM is obtained 5.1(c) AFWR has the right to re-introduce suitable species, according to an approved re-introduction plan and relevant legislation **Duties of AFWR** 5.2(a) Prove that there are Mozambican partners involved in the venture	5.1(a) This sub-clause opens the door to AFWR of including other uses, than those identified up-front 5.2(n) AFWR must take note of these powers, especially with regards to the illegal activities listed in the contract. Ways and means of implementing these powers must be investigated. It should be urgently established how Coutada Field Rangers can be trained and appointed to have at least powers of arrest

5.2(b) The transfer of shares and the admission of new members to AFWR, shall be subject to the prior approval of the GoM, in lieu of which the contract may be cancelled 5.2(d) The prescribed 5-year Management Plans will become part of the contract between AFWR and the GoM, and each subsequent MP must be submitted 12 months prior to the expiry of the plan 5.2(e) Annual Plans of Activities must be submitted before February 28 each year, and must be accompanied by requests for the coming season's hunting quota and the Annual Activities report of the previous season. The first Annual Plan of Activities should be submitted within 60 days of the granting of the contract 5.2(f) An Annual Report of Activity, up to 15 December each year, must be submitted together with the Annual Plan of Activity for the coming year 5.2(h) The proposed reintroduction of wildlife program must be submitted to, and approved by, the GoM, including the numbers of wildlife in the Coutada, the species to be reintroduced, the quantity and origins of the species to be reintroduced, as well as the infrastructure available, together with monitoring and management mechanisms that are in place 5.2(j) Comply with appropriate legislation 5.2(l) Obtain from the GoM the required culling, sport hunting and hunting guide licenses 5.2(m) Ensure that hunting quotas are not exceeded 5.2(n) Maintain the legal and technical wildlife and environmental conservation rules, including (1) Monitoring and combating poaching through a body of sworn inspectors, guards and/or community agents (i.e. Field Rangers) The focus should be on recruiting members from local communities, and combatants of the national liberation struggle. (2) Collaborate with the GoM to control/combat fires, indiscriminate use of natural resources, prospecting and illegal mining, soil erosion, contamination of water courses and bodies, illegal methods of fishing, and finally control the movement of people once the zoning plan has been approved. (3) Wildlife populations and their habitats must be monitored regularly, by means of systems that will detect trends and changes 5.2(o) Comply with investment and development plans contained in the Proposal for the Exploitation and Development of Coutada 5, and the 5-year MP, inclusive of the (1) rehabilitation, construction and development of infrastructure per approved standards laid down by the GoM, (2) permanent or temporary camps and tourist accommodation by prior approval by the GoM of technical projects, and furthermore in accordance with appropriate legislation and policies governing such facilities, (3) the operation of water systems, energy and sewage, (4) the treatment of	5.2(o) and 5.2(p) These stipulations are in line with AFWR policies, but should be strictly adhered to 5.2(q) Professional training of staff by AFWR will not be restricted to hunter guides (as prescribed), but also to other ranks where possible 5.2(r) AFWR will have to take note of, and heed, these contractual duties with regards to the local people. Most of these requirements are in line with AFWR policies, but especially no (6), that vested hunting rights should be respected, will have to be cleared with the GoM. It stands to reason that unsustainable practises of the past cannot be allowed to continue, especially since AFWR will embark on an ambitious and expensive reintroduction of wildlife program. It should be taken into consideration that Coutada 5 encompasses the whole district of Machanga, and that strict adherence to these stipulations may prove to be inapplicable and virtually impossible to implement.

non-degradable solid waste, (5) deliver community support: development of community infrastructure 5.2(p) Employ Mozambican workers, preferably from local communities, and provide accommodation, sanitation and drinking water 5.2(q) Professional training programs must be implemented, especially with regards to supervisory staff, Mozambican hunter guides and, in collaboration with the GoM, offer a formally structured course for such guides 5.2(r) The following apply to administrative authorities and local communities: (1) Collaborate with local authorities with regards to local plans and district development. (2) Ensure that the legal and other rights of people living in the Coutada are respected, and to develop mutually beneficial partnerships. (3) Any written agreements with the local communities must be copied for approval to the District government. (4) Ensure that agreed-on benefits are made available to the local communities. (5) Distribute wherever possible, surplus meat generated by hunting to local communities, health institutions, childcare centres, schools and other disadvantaged groups. (5) Ensure that the vested hunting rights for own benefits are respected, under legislation that governs the issue. (6) Support income generating activities for the local communities.	
7 Management Plan The compilation of a 5-year Management Plan is mandatory, to be submitted to the GoM within 180 days after signing of the contract. The GoM will approve the MP within 90 days. In the last year of the MP, a new 5-year plan must be submitted for approval. The MP must strictly adhere to the terms of reference, structure and format as laid down by the GoM, and must be prepared in a participatory way, involving local communities, local state institutions and other stakeholders	AFWR will have to ensure that all plans, irrespective of their objectives and origins, adhere to the same principles and follow the same policies
8 Annual Plan of Activities AFWR must submit an Annual Plan of Activities up to 28 February, indicating the planned activities for the coming year, and in the prescribed format. The report must indicate how these activities will contribute to realising the objectives of the MP	
9 Annual Report of Activities This report by AFWR must be submitted to the GoM, in the prescribed format, detailing the activities undertaken in the previous year. Any differences between the planned and actual activities must be justified	
10 Zoning The GoM must approve the zoning of Coutada 5, as submitted by AFWR. The construction of houses or social development by local communities in the areas identified as hunting blocks or ecotourism sites, are prohibited. However, in the local development zones	

for communities, such developments may be allowed, under the district development plan, unless such developments will be detrimental to the conservation of natural resources	
11 **Agreements beneficial to the local communities** AFWR must extend, broaden, stimulate and promote benefits to be granted to local communities, as outlined in all the relevant AFWR documents	
15 Prorogation On expiry of the initial contract after 20 years, the validity may be prorogued/extended, provided that AFWR has met all the requirements, and granting to the GoM the right to negotiate reasonable new terms and conditions. The GoM thus reserves the right of informing AFWR of new terms and conditions. A new contract must be negotiated and signed at least 9 months prior to the expiry of the previous contract.	
17 Amendments Any amendments to the contract must be based on a written agreement by both parties.	17 This escape clause may provide an opportunity to AFWR to renegotiate those stipulations that may perhaps inhibit the development of Coutada 5, or that may prove to be too cumbersome or impractical to apply diligently

1.3 APPLICABLE NATIONAL LEGISLATION AND POLICIES

A myriad of policies and laws regulate the use of natural resources in Mozambique. All of these policies/laws will have to be, to a greater or lesser extent, considered in the execution of the primary AFWR objective to develop and rehabilitate Coutada 5. These laws/policies inter alia include the following:

(1) Land:
   a. Land Policy (1995)
   b. Land Law 19/1997)
   c. Land Law regulations (66/1998)
   d. Technical appendix to the Land Law (1999)

(2) Environment:
   a. Environmental Law (1997)
   b. Regulations for Environmental Impact Assessment (76/1998)

(3) Forestry and Wildlife:
   a. Policy and Strategy for Development of Forestry and Wildlife (8/1997)
   b. Forestry and Wildlife Law (10/1999)
   c. Forestry and Wildlife Regulations (2002)
   d. Strategy and Action Plan for the Conservation of Biological Diversity (2003)

(4) Agriculture:
   a. Agrarian Policy (1995)

b. Agricultural sector investment program, including a Forestry and Wildlife National Program (1998), including a section on Community-based Natural Resources Management (CBNRM)

(5) Water:
   a. Water policy (7/1995)

(6) Fisheries:
   a. Fisheries Law (3/1990)

(7) Social:
   a. Poverty Reduction Strategy Paper (2001 – 2005, and others)

1.4 COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT

Community-based Natural Resources Management (CBNRM) can, for Coutada 5, be described as the combination of purely conservation objectives, with the generation of economic benefits for all stakeholders, primarily the local communities. In general, three universally accepted key assumptions with regards to CBNRM can be stated as follows:

- Local people are better placed (but not necessarily equipped) to conserve natural resources
- People will only conserve a resource if the benefits arising from such a venture, exceed the costs of the conservation exercise
- People will tend to conserve these resources that are linked directly to their quality of life

The system of CBNRM has been applied, with varying degrees of success, on a world-wide basis, obviously concentrating on regions where the local communities are relatively poor, and/or historically marginalised with regards to their decision-making ability with regards to their own collective future. Notwithstanding various shortcomings in especially the execution of the system, and even downright failures that have been recorded, CBNRM is probably the only objective system whereby the livelihoods of all stakeholders may be improved by means of the sustainable use of natural resources, and the equitable sharing of benefits.

CHAPTER A2: INTERNAL POLICIES AND COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT

All the internal policies and plans of AFWR that may have a bearing on biodiversity conservation, and a social impact in whatever context, will need to be at least partially based on executing the principles of CBNRM. Furthermore, any management actions taken by AFWR to conserve the natural resources of Coutada 5, will have to focus on how it will affect the quality of life for both present and future generations. AFWR should thus view itself as merely the present-day custodian of Coutada 5, even though the control of the biodiversity resources has been delegated to the company.

However, the Coutada system and the people living in the Coutadas, differ in certain important respects from a situation where a formally protected area is not at stake. Communities living outside of protected areas, are normally regarded as the custodians of the land, or the stewards thereof. They, whilst in the case of Mozambique not being the true owners of the land (the land belongs to the state), may for all intents-and-purposes be regarded as the 'owners' of the land occupied by them. Any conservation action taken on such land, and including the management of the natural resources, will have to be community-based to have any chance of success.

In the case of Coutada 5, however, the situation is not nearly as clear-cut. The agreement with the Government of Mozambique grant usufruct rights to the holding company, AFWR, for the duration of the contract. As such AFWR may be regarded as the 'owner' of the land, for as long as the contact is current. The communities should thus, strictly speaking, be regarded as 'outsiders' and non-stakeholders.

However, in reality the situation is totally different. The people living in Coutada 5, especially in the town of Machanga and its environs, are as permanent a part of the Coutada as would be the case for the biodiversity resources. Even though AFWR would be entitled, at least under certain circumstances, to relocate or resettle people currently living in ecologically sensitive areas or in the core wildlife-wilderness area, such relocation would have to be a negotiated process. The human populations living in Coutada 5 are thus a non-negotiable and indisputable fact. AFWR would nevertheless be entitled to prevent new immigrants to Coutada 5, from settling in sensitive areas, or in areas that have not been settled at the time of the contract with the GoM being signed.

Defining the 'stakeholders' of the AFWR project, would thus be relatively easy: 'Any individual or group who may, directly or indirectly, affect – or be affected by – the development and rehabilitation of Coutada 5, and the achievement of AFWR's objectives'. It is thus clear that AFWR would have to measure all company policies against the prerequisite that the local people will have to be involved, albeit at the level of 'stakeholder' and not as 'owner', in the development of Coutada 5. How such an involvement will be structured, is outlined elsewhere in this BBP.

PART B: GENERAL DESCRIPTION OF THE PHYSICAL ENVIRONMENT AND BIOTA OF COUTADA 5, IN THE CONTEXT OF BIODIVERSITY CONSERVATION AND AGRICULTURE IN MOZAMBIQUE

CHAPTER B1: THE PHYSICAL ENVIRONMENT OF COUTADA 5

1.1 CLIMATE

The climate of the Coutada 5 region, in common with most of Mozambique, is tropical to sub-tropical. At just south of latitude 20º south, in the case of Coutada 5 the climate would tend to lean towards being more tropical rather than sub-tropical. According to the international Koppel climate classification, the climate of the region is tropical humid (AW) (a native vegetation-based classification as an expression of climate, with (AW) described as savannah climate).

The wet season for the region lasts from November to April, coinciding with the warmer months of the year. The Inter-tropical Convergence Zone is, at this time of the year, positioned over the north of Mozambique and is responsible for the summer rains. Mid-winter rain showers, however, can still be expected, with monthly averages of about 20 mm along the coast, and possibly dropping to below 10 mm per month further from the coast. The average rainfall for Machanga is not reliably known, but would be in the vicinity of 750 mm – 800 mm (one source gave a figure of 769 mm), with the average to the west of the EN1 probably being somewhat lower. The average rainfall for the coastal town of Vilanculos, about 100 kilometres due south of Coutada 5 (Machanga), is 803 mm (1975 to 2005). The lowish average annual rainfall for a sub-tropical/tropical on the eastern seaboard such as Coutada 5, may be due to the rain shadow-effect caused by the large island of Madagascar, lying to the east of Mozambique in the Indian Ocean.

Published rainfall data for localities to the north, west and south of Coutada 5, show a surprising variation over a relatively short distance. Massangena, situated about 180 km upstream from Machanga on the Rio Save, has an annual rainfall of 592 mm. Chimoio, an inland city in Manica province, about 240 km northwest of Machanga as the crow flies, has an annual average of 1080 mm. The coastal city of Beira, 130 km due north of Machanga, has an average of 1523 mm (about double the figure for Machanga).

Periodic droughts are reportedly common, and may be regarded as the single biggest threat to the sustainable utilisation of the natural resources, not only biodiversity but also agricultural resources, of Coutada 5. Given the hot summer days and a probably high evaporation rate (substantially more than the precipitation), it stands to reason that a water deficit may be experienced during especially periods of drought.

Seasonal variations in temperature for the region are around 5ºC, with the average daily maximum along the coast fluctuating around 31ºC in January and February. During mid-winter in June/July the average daily maximum temperatures along the coast would be around 25ºC/26ºC. The region is thus frost-free.

Mozambique's coastal location unfortunately means that especially the central regions including Sofala province and thus the also the Coutada, lies in a region of severe and destructive hurricanes and tropical cyclones. Mozambique's central region has been hit by four severe tropical cyclones during the last 16 years. The Coutada, though, is seemingly situated in an area of even higher-risk tropical cyclone occurrence. The town of Vilanculos, for example, has been hit by no less than 23 severe cyclones/tropical storms between 1975 and 2006. Three of these storms were categorised as category 4 (intense cyclone, with wind speed between 166 and 212 km/h) and four as category 3 (tropical storm). Winds gusting up to 280 km/h have been measured!

The world-wide phenomenon of climate change may have far-reaching negative impacts on Mozambique. Indications are that the mean annual temperature for the country has increased by 0,6ºC between 1960 and 2006, an average rate of increase of 0,13ºC per decade. This increase led to the frequency of 'hot' days and 'hot' nights (where the temperature of average days or nights have been exceeded on 10% of the days or nights) increasing by 6,8% or 25 days per annum for 'hot' days and 8,4% or 31 nights for 'hot' nights.

In tandem with an *increase* in temperatures, it has been observed that the mean annual rainfall over Mozambique has steadily *decreased* at an annual average rate of 2,5 mm per month (3,1%) per decade between 1960 and 2006. Projections indicate that so-called 'heavy-event' rainfalls (such as tropical cyclones) will steadily increase. Projections also indicate that the annual temperature will increase by between 1ºC and 2,8ºC by 2060, and by 1,4ºC to even as high as 4,6ºC by 2090. These climate changes will have far-reaching effects on rising sea levels (even rising by as much as 0,56 m by 2090), and also on agricultural productivity (being lowered) and sustainability (being more difficult to achieve). An interesting observation is that Dhows (Arabian?) used to navigate the Rio Save right up to the current border with Zimbabwe, at the confluence of the Save and Lunde Rivers. Such an occurrence is today hardly likely, due to an apparently diminished flow.

1.2 GEOMORPHOLOGY, GEOLOGY AND PHYSICAL PROCESSES

Mesozoic (252 – 66 million years ago) to Cenozoic (66 million years ago to the present) sediments (alluvial) underlay large parts of southern and central Mozambique, including the southeastern regions of Sofala province. The landforms of Coutada 5, an area situated on the homogeneous Mozambican coastal plain, are simple and easily observed. The landscape is predominantly flat, with some restricted hilly areas to the west of the EN1, and an undulating landscape on the shallow calcareous rocks along the Rio Save valley. The current landscapes of Coutada 5 are a result primarily of fluvial processes, with rivers being the main conduits of sediments. River erosion also gradually created the current valley along the Rio Save. Aeolian processes, comprising the ability of the wind to shape the surface and thus the landscape, have and still play a role along especially the open sandy areas on the coast.

1.3 SOILS, SUBSTRATES AND CORAL REEFS

SOILS

No survey of the soils of Coutada 5 has been undertaken, nor is such an expensive and time-consuming undertaking (given the size of the Coutada) deemed necessary at this early stage. However, once the zoning plan of the Coutada has been approved, those areas identified for community-based agricultural ventures on smallholdings, will be surveyed to determine the suitability of the on-site soils for organic farming purposes. With regards to the broader soils picture, some information could be gleaned from official published sources, including the World Soil Information series, as well as unpublished data from the 'Instituto Nacional de Investigação Agronomica's' Department of 'Terra e Agua' (National Institute of Agronomic Research, Department of Land and Water: INIA-DTA). The development of Coutada 5, however, will in the absence of site-specific data, *inter alia* be guided by what macro-scale information is available on the soils of the Coutada. Data gleaned from other published/unpublished sources, for example the GEF/World Bank Biodiversity Management Plan for the Vilanculos Coastal Wildlife Sanctuary, near Vilankulo on the San Sebastian Peninsula to the south of Coutada 5, will be extrapolated where possible. As was mentioned earlier, the total development of Coutada 5 would be sensitive to the environment, inclusive of the soils.

It would seem as if the soils of Coutada 5 can be grouped into the following units (refer to the accompanying soils map):

(1) Alluvial sediments: Alluvial and fluvio-marine areas occur along the eastern coastal region. With regards to soils of alluvial origin, two kinds of sediments have been identified, namely sandy soils along the eastern valley of the Rio Save (unit FS), to the west of Machanga along the northern bank of the river, and reaching inland for some 35 kilometres, and secondly extensive estuarine marine sediments (unit FE) along the entire coastline of the Coutada (about 30 kilometres).

   a. River-borne sediments: The topography is typically gentle, with a slope of less than 1%. The soils of Unit FS are coarse or medium-textured stratified holocene (dating back from about 11 700 years ago to the present) alluvium, with the dominant characteristics being a sandy loam, often greyish brown with depths of more than 100 cm. The drainage is imperfect-poor. The sandy soils are non-saline and non-sodic (with very little sodium [Na] or sodium chloride [NaCl]). The river-borne FS alluvium sandy soils are Eutric Fluvisols (soils found typically on level topography, subject to periodic flooding, such as on the Rio Save floodplain). The level of organic matter in the topsoil will vary according to local conditions. The vegetation on these FS soils is mostly forest to open bush land. The land capability is excellent, with the potential for irrigation varying according to soil texture and possible drainage limitations. In general, the agricultural potential may, at least in certain localities, be limited by drainage and sodicity problems.
   b. Estuarine marine sediments: The topography of the holocene (dating back from about 11 700 years ago to the present) estuarine plains where these typically clayey soils of Unit FE are found is flat, with a slope of less than 1%. The soils are deep and frequently saturated, with a poor to very poor drainage. The soils

are non-saline, whilst the sodicity fluctuates between non-to moderate sodic topsoils and moderately- to strongly sodic subsoils. The marine-borne FE alluvium sandy soils are Salic Fluvisols (soils found typically on frequently-flooded land with level topography), with the vegetation being mangroves or halophilous grasslands (growing in a salt-rich environment). The land capability probably varies between good pasture land to poor pasture land. Irrigation is not recommended due to possible poor drainage and possible salinity/sodicity limitations. The general agricultural potential is thus limited by salinity, sodicity, drainage and periodic flooding problems.

(2) Coastal dunes of the sedimentary basin: There is no dune system along the coast, separating the mangroves from the salt marshes. The boundary between the extensive mangrove swamps and the equally extensive salt marshes has, for the purposes of this BBP, not been established or mapped.

(3) Unspecified sandy soils of the sedimentary basin: The deep sandy soils of Unit A occur on a nearly level landform (slope up to 2%), with good to excessive drainage, depending on structure. The soils are non-saline and non- to moderately sodic, with moderate organic matter. The dominant classification is Arenosols (loamy sand, or with a coarser texture, less than 35% rock fragments and having no diagnostic horizons). The general agricultural suitability is marginal, but the grazing and conservation potential, depending on local soil fertility and texture, should be good. and in the case of conservation even excellent.

(4) Soils of Mananga with sand cover varying in thickness, of the sedimentary basin: The sandy clay loam of Unit MA is yellowish brown, with a moderately thick surface sand layer. The Mananga (sand) sediment is a layer of hard sodic Pleistocene (lasting from about 2,5 million years to 11 700 years ago) deposits less than 20 m deep, with a gradual slope of less than 2%. The drainage is moderate, with the soils being moderately acidic to slightly alkaline. The soils are non- to slightly saline, non- to strongly sodic and the dominant classification is Ferralic Arenosols (loamy sand, or sand with a coarser texture, having less than 35% rock fragments and containing iron and alum). The water holding capacity and possible poor fertility are limitations for agriculture.

(5) Soils of Mananga with sand cover of varying thickness of the sedimentary basin: The yellowish brown sandy clay loam (of Unit MM) on a thin surface sand layer occur on a nearly level landform, with moderate drainage, a low to high organic matter content, are non- to slightly saline and non- to slightly sodic. The dominant classification is Stagnic (sometimes saturated with surface water) or Haplic (uniformly coloured, with no meaningful differentiation) Luvisols (soils with a higher clay content in the subsoil than in the topsoil, due to clay migration, and leading to an argic ‘white clay’ subsoil horizon). General agricultural suitability may be limited by soil hardness, low permeability, acidity and sometimes salinity, but the suitability for pasture/grazing, and thus conservation uses, should be good.

(6) Soils of Mananga with sand cover of varying thickness, of the sedimentary basin: These unspecified Mananga soils of Unit M can be either MM or MA (see above). The topography is very level with a slope of less than 2%, with drainage imperfect-moderate and with organic matter content, sodicity, salinity, agricultural suitability etc determined by the classification as either Unit MM or MA. In general, the agricultural suitability would probably range between good for pasture/grazing, and moderate to marginal for irrigation. The conservation potential would be high.

(7) Soils of clayey Mananga colluvium, of the sedimentary basin: The soils of Unit MC are clayey, dark greyish brown and deep. The colluvium (loose, unconsolidated sediments) is derived from Mananga. The landform is circular depressions at the foot of side slopes and drainage ways. The topography is level (with a slope of less than 1%), and slightly acid to moderately alkaline. The soils are non- to slightly saline and non- to moderately sodic. The dominant classification is Mollic (having a well-structured, dark coloured surface horizon with high base saturation) Solonchaks (literally 'salt marsh', a type of soil formed by salinization, having an exudative water regime, where salts rise to the upper soils layer due to evaporation of groundwater from the surface). Solonchaks contain a substantial amount (up to 15%) of highly soluble salts. The grazing potential may be good to marginal, with the conservation potential being high.

(8) Shallow soils on calcareous (containing calcium carbonate or lime) rocks, of the sedimentary basin: These Unit WK soils are sandy clay loam, brown, and moderately deep. The landform is hills, with the undulating topography varying between level and an 8% slope. The soils are slightly acidic to moderately alkaline, being non- to moderately saline and non- to slightly sodic. The dominant classification is Calcaric (containing more than 2% calcium carbonate) Cambisols (soils with an incipient sub-soil formation) or Eutric Cambisols. The shallow soils of unit WK are suitable for grazing, but largely (except along the floodplains of the Rio Save) unsuited to irrigation.

(9) Summary: In the absence of locality-specific soils data, for the time being, or at least until the more urgent agricultural regions have been surveyed, the abovementioned broad classification of the soils of Coutada 5 will have to suffice. However, notwithstanding the lack of information on the soils, it can be stated that (refer to the soils map):

a. All the soils of the Coutada are based on sand of varying depths and varying agricultural potential;
b. A mixture of soil units M (unspecified Mananga soils) and A (unspecified very deep sandy soils) cover the largest part of the Coutada;
c. The agricultural potential of the various units differ substantially;
d. The conservation potential for grazing animals, even on those soils that have a limited suitability for agriculture, may be good to even excellent; and that
e. The planned future smallholder but nevertheless high-intensity family-based agricultural ventures, can be accommodated on the suitable soils with a high agricultural potential.

CORAL REEFS:

No exact information is currently available as to the possible presence of coral reefs off the Indian Ocean Seaboard of the Coutada. However, it seems unlikely that any coral reefs do occur along this so-called 'swamp coast', where the coastal waters are shallow and often turbid due to the presence of a number of rivers draining into the ocean. These rivers draining Coutada 5, with the Rio Save being by far the most important, are often sediment-rich and formed estuaries with mangrove stands, and are thus unsuited to the development of coral reefs. There are also no suitable offshore bedrock formations to allow coral reefs to develop.

1.4 ECOREGIONS OF MOZAMBIQUE, AND COUTADA 5

An ecoregion is a broad classification of a region's biodiversity, and can be defined as an ecologically and geographically defined area containing distinct assemblages of natural communities and species, thus separating it from other ecoregions. In Mozambique, there are five Terrestrial Ecoregions, of which both the *Tropical and subtropical moist broadleaf forests* and *Tropical and subtropical grasslands, savannas and shrublands* can be found in Coutada 5. Mozambique's Freshwater Ecoregions include the Great Lakes (specifically Lake Niassa/Malawi), the Eastern and Coastal Freshwater Ecoregion (of which small but unrepresentative areas occur in Coutada 5) and the Zambezi Freshwater Ecoregion.

Mozambique's *Tropical and subtropical moist broadleaf forests* include the Southern Zanzibar-Inhambane Coastal Forest mosaic (occurring in Coutada 5), as well as the Maputaland Coastal Forest mosaic in the south of the country. The *Tropical and subtropical grasslands, savannas and shrublands* ecoregion is in Coutada 5 represented by both the *Southern miombo woodlands mosaic* (with a relatively restricted occurrence) and the *Zambezian and mopane woodlands mosaic*, with a widespread occurrence.

The *Mangrove Ecoregion* is, along the Coutada's eastern seaboard to the north of Machanga, represented by the *Southern mangroves ecoregion.* Of the two Marine Ecoregions found in Mozambique, the *Bight of Sofala (Swamp Coast) ecoregion* occurs along the coast of the province. Extensive mangrove swamps and salt marshes occur along the coast of Coutada 5.

CHAPTER B2: THE BIOLOGICAL ENVIRONMENT OF COUTADA 5

2.1 VEGETATION

2.1.1 General remarks

A preliminary biodiversity survey, to be followed up by a mid-summer survey in early 2014, has been undertaken by Dr Niels Jacobsen, assisted by Mr André Engelbrecht. The following discussion is based on the preliminary data submitted by the two authors. The full interim document is attached hereto as an appendix. The next phase of the survey will

take place in mid-summer of 2014. The botanical data contained in this section of the BBP will then be updated.

In a provisional checklist prepared by Da Silva, Izidine & Amude (2004), they recorded 3932 indigenous plant species from Mozambique as well as 516 alien taxa. Of the former 177 are regarded as endemic to the country.

The vegetation of Coutada 5 appears to have substantial species richness, with in excess of 300 plant species recorded to date. However due to the timing of the survey many species were in a state of senescence, and therefore difficult or impossible to identify to species or genus level. It is expected that a follow-up visit during summer will provide many additional records as well as confirming current identifications, many of which are at present only to genus level (Refer to the Appendix: Vegetation species list). Two *Euphorbia* spp. may represent undescribed taxa.

2.1.2 Rare and threatened plants

According to Isidine and Bandeira (2002) 300 plant species are considered threatened in Mozambique of which approximately 41 have been recorded from Sofala Province (refer to the table below). Many of these are unlikely to occur in the Coutada due to a lack of suitable habitat. During the course of the survey five species including *Searsia refracta* listed as Vulnerable, *Afzelia quanzensis* Lower Risk- least concern, *Xylia torreana* Lower Risk – least Concern, *Millettia stuhlmannii* Lower Risk – least concern and *Pavetta sp. cf catophylla* listed as Data Deficient, were recorded on site. It is likely that more rare and threatened species will be recorded in a follow-up visit.

RED DATA SPECIES RECORDED AS OCCURRING IN SOFALA PROVINCE, MOZAMBIQUE (after Izidine & Bandeira 2002)			
SPECIES	RDB	HABITAT	Family
	STA		
Celosia pandurata	VU	Forest	Amaranth
Lannea stuhlmannii var tomentosa		Widespr	Anacardia
Searsia refracta		Decid.For	Anacardia
Impatiens psychadelphoides ?		Forest	Balsamin
Rourea minor			Connarac
Crassula leachii		Granite	Crassulac
Croton leuconeurus ssp mossambicensis			Euphorbia
Euphorbia plenispina		Lichens	Euphorbia
Acacia torrei		Savanna	Fabaceae
Nesaea spathulata		Wetland	Lythracea
Dorstenia zambesiaca		Forest	Moraceae
Ochna beirensis		Coastal	Ochnacea
Spermacoce kirkii		Coastal	Rubiaceae
Sterculia appendiculata		Forest	Sterculiac

Sterculia quinqueloba		Savanna	Sterculiac
Cordia stuhlmannii	LR-lc	Thicket	Boraginac
Cleome bororensis			Capparac
Dichapetalum barbosae		Savanna	Dichapeta
Jatropha scaposa		Coastal	Euphorbia
Afzelia quanzensis		Forest	Fabaceae
Xylia torreana		Mopane	Fabaceae
Millettia mossambicensis		Widespr	Fabaceae
Millettia stuhlmannii		Widespr	Fabaceae
Milicia excelsa		Riparian	Moraceae
Jamesbrittenia carvalhoi			Scrophula
Cola clavata			Sterculiac
Glyphaea tomentosa		Decid.W	Tiliaceae
Maerua brunnescens	DD	Acacia W	Capparac
Ipomoea consimilis		Savanna	Convolvula
Dichapetalum deflexum		Savanna	Dichapeta
Phyllanthus medoncae		Grasslan	Phyllantha
Eriocaulon infaustum		Wetland	Cyperacea
Adenopodia schlechteri		Thicket	Fabaceae
Triaspis suffulta		Savanna	Malphigiac
Memecylon souzae		Widespr	Melastoma
Eulophia biloba		Coastal	Orchidace
Buchnera namuliensis		Wetland	Scrophular
Coffea zanguebariae			Rubiaceae
Pavetta catophylla		Forest	Rubiaceae
Hermannia micropetala ?			Malvaceae
Grewia hornbyi		Savanna	Tiliaceae
VUL = Vulnerable; LR-lc = Lower Risk - least concern; DD = Data deficient.			

2.1.3 Vegetation types

As mentioned previously the vegetation in the area is mostly comprised of woodland, thicket and grassland. Wild & Grandvaux-Barbosa (1967) included a vegetation map of Mozambique as part of a Supplement to Flora Zambesiaca, identifying eight, possibly nine vegetation types present within the area of the Coutada (refer to the table below). This was simplified by K.Tinley in Smithers & Lobao-Tello (1976) and by Jacobsen & Engelbrecht, this report (see table below).

A COMPARISON OF VEGETATION TYPES OCCURRING IN COUTADA 5, ACCORDING TO WILD & GRANDVAUX BARBOSA, TINLEY AND THE PRESENT ASSESSMENT		
Wild & Grandvaux	Tinley 1970	Jacobsen & Engelbrecht 2013

Barbosa 1967		
Mangrove		Mangrove
Deciduous Dry Miombo (Lowland Woodland)	Miombo Savanna	Miombo Savanna
Deciduous Miombo Tree Savanna with gregarious dense dry woodland		
Deciduous Miombo Tree Savanna (Sublitoral)		
Deciduous Tree Savanna with Palms (badly drained Lowland)	Alluvial Grasslands	Grassland/ Hyphaene Palm savanna
Dry Deciduous Tree Savanna	Acacia Savannas	Mixed Deciduous Woodland
(Lowland)	Mopane Savanna	Mopane Woodland/Scrub
Open Deciduous Tree Savanna (Lowland)		
Dry Tall Mixed Thicket (Lowland)	Tropical Forest and/or Thicket Mosaics	Thicket
Dry Tree Savanna – Moist Grassland – Fringing Forest Aquatic Flora		Riparian Woodland
Mosaic of Big River Alluviums and Deltas (Lowland, sub-littoral)		Not yet assessed

During the brief field survey it was soon apparent that several vegetation types occur on Coutada 5 but, due to the changes in soils and soil moisture relationships over short distances, many occupy small areas which are impractical to attempt to map, especially when the large area (687 000 ha) of the Coutada is taken into consideration. Any in-depth vegetation mapping will result in such a complex mosaic of vegetation types that it will

have no real management advantage. A total of seven vegetation types are recognized, all equating to one or other of those mentioned by Wild & Grandvaux-Barbosa and Tinley, the only exceptions being the zone of riparian and aquatic vegetation along the smaller rivers in the Coutada and the Mosaic of Big River Alluviums and Deltas, as the latter was due to a lack of time not assessed during the present survey.. With the exception of the Save River which forms the southern border of the Coutada, the riparian vegetation on the remaining rivers tends to form narrow zones which extend through one or more of the other vegetation types. Many of the associated species are shared with vegetation communities occurring on the large numbers of termitaria found in the area.

Interim descriptions of the vegetation types and communities recorded during the current survey are incorporated below:

(1) <u>Mixed Deciduous Woodland</u>

This vegetation type covers a large proportion of the area west of the EN1 and is characterized by the large number of tree and shrub species and a dense grass field layer. Species typical of this veldt type include *Pseudolachnostylis maprounifolia, Sclerocarya birrea, Terminalia sericea, Burkea africana, Crossopteryx febrifuga, Dicrostachys cinerea, Ozoroa obovata, Hyphaene coriacea, Acacia nigrescens, Vangueria infausta, Albizia versicolor, Vitex mombassae* and *Grewia bicolor* amongst others. Although there is usually a mixed species composition, monotypic stands of some species such as *Terminalia sericea* and *Acacia* spp. occur.

Grasses are abundant and also of mixed species composition, in particular *Heteropogon contortus, Hyparrhenia spp., Digitaria eriantha, Urochloa mossambicensis, Perotis patens, Eragrostis rigidior* and *Aristida congesta* ssp. *barbicollis.* Grass height is mostly 0,4-1,2 m while aerial and basal cover varies according to grass species present, the frequency of fires and also the quality of the soils. Few forbs were recorded at the time of the survey.

This vegetation type also has large numbers of bushclumps associated with termite mounds. These communities differ from the vegetation of Mixed Deciduous Woodland as more evergreen species tend to be present, although most also grow scattered in the surrounding woodland. Such bushclumps also vary considerably in species composition depending on soil moisture relations and many have depressions on one side which form small seasonal wetlands. Such communities are characterized by one or more large emergent species such as *Tamarindus indica, Diospyros mespiliformis, Mimusops zeyheri, Acacia burkei, Manilkara mochisa* and *Sideroxylon inerme* together with smaller trees, shrubs and climbers. These include *Antidesma venosum, Zizyphus mucronata, Spirostachys africana, Euclea natalensis, Tricalysia sp., Senna petersiana, Grewia bicolor, G. sulcata, Flagellaria guineense, Asparagus spp., Landolphia kirkii* and *Rhoicissus revoilii*. Grasses such as *Setaria* spp., *Panicum maximum* and *Eragrostis* spp. are often present towards the foot of the mound. Inside the mounds the vegetation cover may be sparse or absent depending on the infiltration of light.

(2) <u>Mopane Woodland/ Scrub</u>

Mopane Woodland/Scrub is comprised of two communities ie Woodland and Scrub/ Grassland, but with *Colophospermum mopane* always forming a substantial part of the vegetation type. Mopane Woodland/scrub also occurs over a large proportion of the area west of the EN1 interdigitating with Mixed Deciduous Woodland. The grass composition is diverse but tends to be the same throughout with local variation according to soil moisture. Grass height varies from short (< 30 cm) to tall (1 m) along drainage lines.

i) Woodland

Mopane Woodland tends to be comprised of tall 3-6m, mostly straight stemmed Mopane trees with a few other trees such as *Combretum hereroensis, Terminalia sericea, Combretum apiculatum, Ormocarpum trichocarpum, Gardenia volkensii, Piliostigma thonningii, Crossopteryx febrifuga, Acacia nilotica, A. nigrescens* and *Dalbergia melanoxylon*. Shrubs are few, mostly *Cissus cornifolia, Combretum hereroensis* and *Asparagus* sp., except on termitaria, with a grass dominated field layer. An epiphytic orchid *Ansellia africana* grows on Mopane trees.

Grasses are varied including *Panicum sp., Pogonarthria squarrosa, Brachiaria serrata, Hyparrhenia spp., Eragrostis superba, Heteropogon contortus* and *Digitaria eriantha*. A sedge *Cyperus obtusiflorus* may be common in the field layer. Grass height varied from 0,40 -1m.

Termitaria in Mopane are often dominated by *Grewia bicolor* and *Ximenia americana*, but other species such as *Searsia refracta, Pappea capensis, Tricalysia sp., Gymnosporia buxifolia, Adenium obesum* and *Vangueria* sp. may also be present. Grasses include *Panicum maximum*.

(ii) Scrub/Grassland

In contrast Mopane Scrub/Grassland, often found on poor soils, is comprised of scattered low growing Mopane shrubs rarely reaching 1m in height, often together with shrubby *Combretum hereroensis, Ormocarpum trichocarpum, Acacia nilotica* and *Ximenia americana* in a short to medium tall grassland mostly of mixed species composition. Grass species include *Heteropogon contortus, Trachypogon spicatus, Cymbopogon excavatus, Brachiaria serrata, Digitaria eriantha, Aristida congesta ssp. barbicollis* and *Pogonarthria squarrosa*. A sedge, *Bulbostylis hispidula* is a common constituent while forbs are sparsely represented by a few species such as *Blepharis subvolubilis, B. sp., Agathisanthemum bojeri* and an *Indigofera* sp.

(3) <u>Riparian Woodland</u>

The Riparian zones along the rivers vary from strips 10 - 50 m wide along the Bunga and other rivers to 100 m or more along the Save River. The trees along the river bank are

tallest forming an almost closed canopy, but are more open away from this narrow zone, similar to that along the Save River, with smaller trees and shrubs growing between the larger trees. Grasses tend to be clumped and tallest under the trees.

Tree species are mixed and vary in height from approximately 5 -20 m, the largest trees being found along the Save River. Species include *Albizia versicolor, A. glaberrima, Kigelia afiricana, Combretum imberbe, Afzelia quanzensis, Trichilia dregeana, Ficus sycamorus, Philenoptera violacea, Terminalia sericea, Hyphaene coriacea, Combretum apiculatum, Acacia robusta, Tabernaemonata elegans, Piliostigma thonningii, Mimusops zeyheri, Garcinia livingstonei, Markahamia zanzebarica* and others.

Shrubs are varied including *Maerua juncea, Grewia bicolor, G. inaequilatera, G. leptopetala, G. sulcata, Hyphaene coriacea, Thilachium africanum, Gymnosporia senegalensis, Capparis sepiaria, Acacia nilotica, Vernonia colorata* and *Searsia gueinzii* amongst others.

Grasses vary with *Panicum maximum* and *Digitaria* sp. in the Save riparian. Closer to the water, along both the Bunga and Muari Rivers, *Vetiveria nigritana* forms large tussocks with *Phragmitis mauritianus* in or adjacent to the water.

In the shallows the forb *Ludwigia pubescens* form extensive monotypic clumps. Climbers such as *Tacazzea apiculata, Paederia bojeriana, Combretum microphyllum, Jasminum sp, Cissus rotundifolius* and *Pergularia daemia* are common to abundant.

(4) <u>Grassland/ Hyphaene Palm Savanna</u>

Most of the area comprising this vegetation type is seasonal wetland and lies east of the EN1 between the Mangroves along the seashore and the Miombo, Thicket and Mixed Deciduous vegetation further west.

This vegetation type is dominated by grasses and *Hyphaene coriacea* palms, the former predominating. Sparsely scattered bushclumps also occur dominated by woody species.

In the north closer to the Gorongoza River a small area of this veldt type was characterized by short grasses, with a poor aerial and basal cover. Grasses such as *Sporobolus iocladus* and *Digitaria eriantha,* a sedge *Bulbostylis hispidula* and a forb *Vernonia* sp.dominated open areas between clumps of palms with a *Sesbania* sp. also present.

Around clumps of *Hyphaene*, forbs and shrubs were also recorded especially on mounds. These included *Albizia antunesii, Schotia brachypetala, Dicrostachys cinerea, Commiphora glandulosa,, Sideroxylon inerme, Gymnosporia senegalensis, Zizyphus mucronata, Ehretia amoena, Sarcostemma viminale, Cissus rotundifolia, Justicia sp., Celosia* sp. and *Hibiscus cannabinus* among others.

Further south in the vicinity of Devinhe, medium to tall grasses including *Hyparrhenia* spp, *Trachypogon spicatus, Ischaemum fasciculatum, Heteropogon contortus, Hyperthelia dissolute, Imperata cylindrica, Eragrostis amoena* and *Panicum* sp. amongst others dominated the field layer with scattered clumps of *Hyphaene coriacea*. Some small trees such as *Parinari curatellifolia, Syzygium guineense* and *Annona senegalensis* were recorded but more woody species grew on termitaria forming bushclumps. These include *Albizia versicolor, Pseudolachnostylis maprouneifolia, Garcinia livingstonei, Pappea capensis, Phoenix reclinata, Sideroxylon inerme, Spirostachys africana, Lantana camara* and *Strychnos madagascariensis* among others. *Flagellaria guineensis* and *Abrus precatorius* climbed into the woody species. The level of water in a pit was approximately 1,5m below the surface.

Fringing the Save River riparian is a grass dominated wetland primarily of ?*Eriochloa stapfianus* (to be confirmed) as well as *Bothriochloa radicans* with Fever Trees *Acacia xanthophloea,* much of which towards Majavane and Javane has been cultivated.

(5) <u>Miombo with Bushclumps</u>

Miombo with numerous termitaria and associated bushclumps, interspersed with areas of short to medium tall grassland is mostly present east of the EN1, integrating with patches of thicket. Soils appear to be of a more sandy nature than is the case west of the EN1.

Miombo is characterized by the presence of clumps of *Julbernadia globiflora* as well as, but less common, *Brachystegia spiciformis*. Patches of woodland with *Brachystegia bussei* dominant are also found. Few trees occur in the grassland between bushclumps these including *Hyphaene coriacea* and *Crossopteryx febrifuga*. Grasses predominate including *Hyparrhenia* spp., *Aristida congesta* ssp *barbicollis, Ischaemum fasciculatum* and *Brachiaria serrata* together with a few forbs such as *Buchnera* sp., *Indigofera* sp., *Eriosema psoraleoides* and *Cycnium tubulosum*. The grassland has a poor aerial and basal cover with relatively low grazing potential.

The bushclumps on termitaria are more species rich and usually characterized by one or two tall emergent trees. Apart from *Julbernadia*, other species include *Brachystegia bussei, B. spiciformis, Mimusops zeyheri, Mundulea sericea, Catunaregam obovata, Vangueria* sp., *Ochna* sp. cf *natalitia, Dalbergia melanoxylon, Gardenia volkensii, Searsia gueinzii, Euclea divinorum, Lannea schweinfurthiii, Sideroxylon inerme, Strychnos madagascariensis, Mystroxylon aethiopicum, Diospyros mespiliformis* and *Thilachium africanum*. Climbers include *Landolphia kirkii* and *Cissus rotundifolius*.

The species composition of such bushclumps varies from clump to clump but many component species occur throughout.

(6) <u>Thicket</u>

Clumps or areas of thicket are widespread and some may be locally extensive. The species composition and structure of the vegetation differs from that of the other veldt

types, although some of the component species may also occur elsewhere. Tall emergent trees may occur but thickets are characterized by a more dense growth of smaller trees and shrubs and a poorer field layer. Three basic communities are apparent as follows:

(i) *Androstachys johnsonii* Thicket

Msimbiri *Androstachys johnsonii* forms dense almost monotypic thickets at localities throughout the Coutada. Such thickets are mostly small in area. Often tall emergents such as *Brachystegia bussei* occur within or on the margins of such thickets as well as other woody species such as *Euclea divinorum, Sideroxylon inerme, Manilkara mochisa, M. discolor, Rhigozum zambesiacum, Acacia burkei, Carissa tetramera, Craibia zimmermannii, Zizyphus mucronata, Pappea capensis, Olax dissitiflorus, Mystroxylon aethiopicum, Vepris reflexa, Ximenia Americana, Maerua decumbens, Euclea natalensis, Thilachium africanum, Croton pseudopulchellus* and others. Climbers include *Strophanthus* sp. and *Landolphia kirkii*.

The field layer is mostly bare under Msimbiri with grasses only present in open areas where light can penetrate, and around the perimeter where enough sunlight reaches the ground. Grasses such as *Digitaria eriantha, Sporobolus fimbriatus, Eragrotis gummiflua, Heteropogon contortus* and *Aristida congesta* ssp. *barbicollis* were recorded. A *Commelina* sp. was the only forb recorded.

(ii) Mixed Deciduous Thicket

Most of the thickets can be considered to be Mixed Deciduous Thicket which consists of emergent trees, mostly *Brachystegia bussei*, sometimes together with *Adansonia digitata*. Most of the trees and shrubs are deciduous species and it appears likely that all of the areas with trees devoid of any foliage as seen from aerial reconnaissance of the area, form part of this vegetation community. In the vicinity of the aptly-named Baobab Grove (a probable "special preservation" community; see below) woody species included *Pteleopsis myrtifolia, Strychnos spinosa, S. madagascariensis, S. potatorum, Cassia abbreviata, Crossopteryx febrifuga, Monotes glaber, Diospyros mespiliformis, Grewia bicolor, Hippobromus pauciflorus, Xylia torreana, Vitex mombassae, Hyphaene coriacea, Sclerocarya birrea, Markhamia zanzebarica, Phyllanthus reticulatus, P. pinnatus, Capparis sepiaria, Combretum apiculatum, Acacia nigrescens, A. robusta, Thilachium africanum, Gymnosporia senegalensis* and others.

The field layer includes stands of *Ocimum americanum* and in more open areas grasses such as *Heteropogon contortus, Eragrostis rigidior, Urochloa mossambicense*, and *Digitaria eriantha*.

(iii) Rocky Outcrops Thicket

Few areas of Rocky Outcrop Thicket is present in the area, all on a few low hills formed by outcrops of a silcrete or conglomerate; two being towards the western boundary of the area (one may be part of Coutada 4) appear to be covered by Msimbiri while one in the

vicinity of Buffalo Camp has Msimbiri along the rocky slopes with mixed deciduous thicket on the crest. The latter appears to be of particular importance in that several species have only been recorded here and nowhere else. This locality may also be declared and managed as a "special preservation" community (see below).

Baobab *Adansonia digitata* is common on the crest together with *Brachystegia bussei*. Other woody species include *Manilkara mochisa, Boscia albitrunca, Colophospermum mopane, Strychnos madagascariensis, Monotes glaber, Catunaregam obovata, Acacia burkei, Androstachys johnsonii, Phyllanthus pinnatus, Gardenia resiniflua, Thilachium africanum, Diospyros mespiliformis, Commiphora glandulosa, Dalbergia sp., Xylia torreana, Grewia flavescens* and *Euphorbia lividiflora*.

Numerous climbers such as *Strophanthus* sp., *Cissus rotundifolius, C. quadrangularis, Rhoicissus revoilii, Asparagus falcatus* and *Landolphia kirkii* are present. The field layer includes two *Euphorbia* spp., one of which, together with a *Huernia* sp. and *Plectranthus tettensis* is associated with rocky outcrops, *Asparagus* sp., *Waltheria indica, Commelina* sp., *Barleria saxatilis, Hibiscus cannabinus, Kalanchoe* sp. cf *rotundifolia* with *Stylochaeton natalensis* among rocks on the slope.

(7) <u>Mangroves</u>

The Mangroves form a relatively narrow zone along the inlet at Divinhe, behind which is a narrow zone of thicket vegetation. The mangroves comprised three species namely White Mangrove *Avicennia marina*, Black Mangrove *Bruguiera gymnorhiza* and Red Mangrove *Rhizophora mucronata*. Due to tidal action the field layer was bare with the exception of swards of a halophytic grass *Sporobolus virginicus* which grew on raised mounds. Adjacent to the mangroves but higher up the bank many other species were recorded including *Salvadora persica, Capparis sepiaria, Sideroxylon inerme, Ekebergia capensis, Manilkara mochisa, Gymnosporia sp., Euclea natalensis, Sclerocarya birrea, Acacia burkei, Pappea capensis, Thilachium africanum, Olax dissitiflora, Searsia gueinzii, Tamarindus indica, Anisotes formosissimus* and *Zizyphus mauritiana*. *Cissus rotundifolia* grew over the shrubs and low trees.

Outside of the thicket, grass, mostly *Setaria* sp. was recorded. Other forbs included *Sansevieria concinna, Cocculus hirsutus, Abutilon* sp., *Asparagus* sp., *Rhynchosia* sp. cf *caribaea* and *Justicia flava*.

2.2 AVIFAUNA

Due to the large area, the paucity of roads and the long distances that had to be traveled, it was only possible to make incidental observations together with those recorded by other members of the assessment team and the staff of the Coutada. Birds are seemingly not abundant in the Coutada, in particular the absence of game birds such as francolin, spurfowl and both species of guineafowl during the survey was noticeable. The appendix to this BBP lists the birds recorded. Amongst the most frequent birds seen were Gabar (*Micronisus gabar*) and Dark Chanting Goshawks (*Melierax metabates*) and Lilac-breasted Rollers

Coracias caudata, while Bateleurs *Terathopius ecaudatus* were seen closer to the Save River and Gymnogene along the Bunga River. No ducks or other waterfowl were recorded along pools in the latter and Muari Rivers.

Wattled Crane *Grus carunculatus* listed as Critically Endangered according to IUCN criteria (Barnes 2000), was recorded near Devinhe on a previous visit (2002) to the area (A. von W. Lambrechts pers comm.). This may be of international importance for this endangered species, should there be a breeding population here.

2.3 HERPETOFAUNA

Due to the timing of the initial survey (Mid-winter) few reptiles were seen but the area is likely to be rich in numbers of species (refer to the appendix). Some lizards such as Cape Dwarf Gecko *Lygodactylus capensis*, Flat-headed Tropical House Gecko *Hemidactylus platycephalus*, Striped Skink *Trachylepis striata*, Variable Skink *T. varia*, Common Rough-scaled Lizard *Ichnotropis squamulosa*, Peters' Ground Agama *Agama armata* and Common Chameleon *Chamaeleo dilepis* were recorded. A Skink *Trachylepis* sp. occurring in Mopane Scrub/ Grassland, and related to the Variable Skink, appears to be an undescribed taxon.

The Cape Dwarf Gecko *Lygodactylus capensis* is a widespread species occupying dead trees and branches on the ground, but was only recorded within Msimbiri *Androstachys johnsonii* clumps which appear to offer some refuge from wildfires, which ravage the area outside of such clumps.

Tracks of snakes were seen but none recorded. According to the staff at Buffalo Camp, the Southern African Python *Python natalensis* has been seen in the vicinity.

Crocodiles *Crocodylus niloticus* were seen along the Rio Save as well as along the lower reaches of the Muari River.

Amphibians were seen along the banks of water bodies, mostly being immature specimens and therefore difficult to identify. Only one species, likely the Common River Frog *Amietia angolensis* was recorded and several Puddle Frogs (*Phrynobatrachus* spp.) were also seen, but require a more in depth assessment.

With the exception of the Southern African Python *Python natalensis* which is listed in South Africa as Vulnerable (Branch 1988), none of the reptiles or amphibians recorded to date is rare or threatened.

2.4 FRESH WATER AQUATIC SYSTEMS AND BIOTA

Unfortunately, it was not possible as yet to undertake a specialist survey of the considerable freshwater resources of Coutada 5, prior to the compilation of this BBP. It is, however, planned to undertake monitoring surveys that will provide baseline data, as well as background information on which to base a freshwater operational policy/plan.

In Mozambique, a highly impressive total of 349 fish species have been identified to date. By stark contrast, neighbouring South Africa and Zimbabwe has 'only' 176 and 159 fresh water fish species, respectively. For comparative purposes, in Europe, Germany has some 120 species. Notwithstanding the large number of species that have been identified, especially the ecological knowledge of Mozambique's freshwater fish resources can be regarded as very sketchy.

Of the 349 identified species, no less than 20 freshwater fish species are endemic to Mozambique, and would thus probably warrant special conservation attention. These 20 species belong to the Families Cichlidae, Nothobranchiidae, Amphiliidae, Bagridae, Cyprinidae, Eleotridae, Gobiidae, Kneridae and Poeciliidae. The Cichlids in particular are morphologically diverse, with at least 1,650 species described worldwide. The well-known Mozambique Tilapia, *Oreochromis (Tilapia) mossambicensis,* is probably the most common fish in the Coutada's freshwater systems. Should monitoring surveys indicate the presence of any of the endemic species in the waters of Coutada 5, special conservation efforts will be launched. The obvious ongoing and intensive utilisation of the fresh water systems in Coutada 5, however, may have had serious negative impacts on especially the scarcer species.

2.5 MAMMALS

The impact of the unsustainable utilization practices of the past, which are still continuing to this day, is nowhere more noticeable than in the almost total absence of large herbivores and carnivores. During the survey, few mammals were recorded in the Coutada and of those, with some exceptions, densities were low. These included sight records as well as spoor and faeces confirmation (see also Table 6 in the appendix). It appears that hares are still relatively common and widespread. According to Smithers & Lobao Tello (1970) it is possible that two species, the Scrub Hare *Lepus saxatilis* and the Cape Hare *Lepus capensis*, may be present with the latter preferring open grassy areas, the former more wooded sites.

Small numbers of Impala *Aepyceros melampus*, Kudu *Tragelaphus strepsiceros* and Nyala *T. angasi* as well as Grey Duiker *Sylvicapra grimmia*, Oribi *Ourebia ourebi* and Suni *Nesotragus moschatus* survived the onslaught, while Hippopotamus *Hippopotamus amphibius* occur along the Rio Save, albeit in relatively low numbers. There is an absence of larger predators as is to be expected with such a low prey base. What was surprising is that apart from genets, there is seemingly an absence of smaller carnivores such as mongooses and wild cats.

Baboons *Papio ursinus* were also seen on several occasions while the calls of the Thick-tailed Bushbaby *Otolemur crassicaudatus* were frequently heard during the night.

Rodent activity was also found to be very low with only three species (a total of six individuals) captured and released in 130 trap nights. These included the Bushveld Gerbil *Tatera leucogaster*, Spiny mouse *Acomys spinosissimus* and Multimammate Mouse *Mastomys natalensis*. This is a capture rate of 4,6% which is very low. It is difficult to ascribe this to any specific factor but the preponderance of veldt fires comes to mind, as

there is no cover for such animals following the advent of such fires, making them vulnerable to predation. Within thickets the paths of the Four-toed Elephant Shrew *Petrodromus tetradactylus*, the largest of the southern African species, were noted. It was noteworthy that no rodent paths were seen despite the relatively dense aerial grass cover seen in some areas indicating an absence of diurnal rodents, substantiated by only capturing nocturnal species. Due to time constraints and logistics much of the area could not be covered. A follow-up survey scheduled for early 2014 should yield additional data.

None of the species recorded are threatened according to IUCN criteria (Friedmann & Daly 2004).

2.6 INVERTEBRATES

Similar to that experienced for most of the fauna, the invertebrate richness, with the exception of butterflies, appeared to be poor. Butterflies were numerous despite the timing of the survey and several species were recorded (Table 7 of the appendix). However, due to time constraints it was not possible to survey them in greater detail. This shortcoming will be alleviated somewhat during the next survey, planned for early 2014. None of the species recorded are rare or threatened.

Other invertebrates included juliform millipedes such as *Doratogonus* sp. but few were seen. A scorpion of the genus *Opisthocanthus* sp. was also recorded from under the bark of a log in a stand of Msimbiri.

In the vicinity of water numerous dragonflies such as the Violet Dropwing *Trithemis annulata* and Damselflies were seen, the latter including the Common Citril *Ceriagrion glabrum*, an orange species.

Some spiders were seen including Flatties *Anyphops* spp. and a Baboon Spider possibly of the genus *Augacephalus* or Star-burst Baboon Spiders, the name likely derived from the pattern on the thorax of these spiders.

2.7 RANGE CONDITION, CARRYING CAPACITY AND WILDLIFE REINTRODUCTION PROGRAM

2.7.1. Introduction

The primary objective of this activity was to assess the suitability of the Coutada for wildlife, to undertake an initial assessment of the herbivore carrying capacity and to submit recommendations for a major wildlife, including apex predators, reintroduction program. The survey had to consider the selection of an appropriate area to be rehabilitated and restored, in the face of the unsustainable practices of the past that left an extremely depauperate wildlife in its wake. AFWR soon realised that a total rehabilitation of the Coutada and a restoration of the depleted wildlife, would be prohibitively expensive and, given the practical realities of such a large re-introduction progamme, virtually impossible to execute. A desk study then identified areas to be concentrated on.

Given the large size of the Coutada, namely 687 000 ha or 6 870 km², it was impossible to undertake the survey in any detail. The paucity of roads led to the AFWR survey staff being forced to concentrate on aerial surveys. Quick ground surveys were then done to ascertain the suitability of those areas selected from the air, but this was limited to the few areas that could be reached by road in the limited time available.

The selection of a specific area to be rehabilitated was further complicated by the fact that some areas of especially the western regions of Coutada 5, which has during the desk exercise provisionally been identified as the future core wildlife zone, have been settled by people, although at low densities. AFWR accepted the principle that as few as possible families would be resettled, thus adding to the difficulty of speedily identifying the best regions to be zoned for wildlife. AFWR will thus endeavor to select an area for rehabilitation that is sparsely populated by humans, or preferably not at all. At the time of writing of this BBP, this extensive investigation of all the social parameters is still ongoing. The area zoned for the core wildlife-wilderness area (refer to the zoning map) is thus at this stage provisional.

However, notwithstanding the abovementioned practical realities, discussions with old-timers who knew the area before the devastating civil war left its mark on the wildlife populations, as well as literature studies, indicated that wildlife was indeed abundant to at least the late 1970's. This included most of the species that have since been exploited to local extinction, such as elephant, buffalo, eland, sable antelope, blue wildebeest, plains zebra, lion and Lichtenstein's hartebeest. Successful safari hunting operators, with renowned hunters such as Robert Ruark and Harry Manners, created a hunting destination that was indeed in high demand. That the Coutada provided a highly suitable habitat to a variety of game species, that have since then all but disappeared, is thus an unquestionable fact.

2.7.2 Ecological and anthropogenic issues

2.7.2.1 The impact of man

Field observations indicate that although human densities are low in the rural areas of Coutada 5, their impacts on the environment are none the less marked. Most if not all households depend largely on natural products obtained from the lakes, pools in the rivers, woodlands and grasslands. These take the form of fuelwood, timber, thatching grass, fruit, ilala palm wine, and wild honey among others.

The greatest human impact, however, involved the local game species that roamed the Coutada in large numbers. As was pointed out above, most of them disappeared, or are still only present in widely-scattered small herds. The same fate overtook the large predators. Though no real evidence can be presented, it stands to reason that unsustainable harvest must have been the real cause of this catastrophic reduction in numbers. It seems as if unsustainable harvesting continues to this day, the only difference

being that the focus of the poachers has, not surprisingly, shifted to small species such as suni and oribi.

The absence of grazing animals over large areas of the Coutada, had another but also important negative effect that can directly be attributed to the influence of man: under utilization of especially the grass sward and frequent uncontrolled burns inevitably led to deterioration in the quality of the grazing. Moribund grasses are in evidence in especially the areas of poorer soils, and in some instances it would seem as if frequent uncontrolled and out-of-season man-made burns led to bush condensation.

Slash-and-burn (ash fertilization or swidden) agriculture is widely practiced in the Coutada. This practice is common in the low-fertility miombo soils of Africa, particularly in the wetter regions (such as Coutada 5) where woody plant biomass is high and cut trees regenerate rapidly through resprouting. The technique involves the cutting and stacking of the foliage and branches of trees, where after they are allowed to dry out before being burned. By concentrating the brush into large piles a deeper bed of ash and somewhat greater fertility is achieved. This is especially important where livestock numbers are very low or non-existent, such as in large areas of Coutada 5. The land is then cultivated until the enhanced fertility is exhausted or until the regenerating woody vegetation and weeds make cultivation unproductive. The plot is then abandoned and new areas are opened up. Given the low human population in the rural areas, however, the human disturbances that can be attributed to slash-and-burn cultivation, are only evident in a few localities in the core wildlife-wilderness zone.

2.7.2.2 The impacts of veldt fires

It appears that the vegetation of Coutada 5 comprises a fire sub climax, with most species, with the exception of evergreen trees and shrubs, being deciduous and resistant to fire, resprouting following the passage of a burn. Those that are not resistant are in time killed off. Without fire it is likely that there will be an increase in fire sensitive species with larger areas of thicket or closed canopy woodlands.

The absence of any moribund material indicates that veldt fires are frequent. Despite this the grass sward is still good, but largely comprised of ‘sour’ less palatable species. Grasses such as *Hyparrhenia* spp., *Hyperthelia dissolute* and *Heteropogon contortus* may have increased as a consequence, with less robust tussock species declining. Especially in areas of scrub Mopane, basal cover is poor, with fires possibly also having played a role.

Frequent fires may affect evergreen species and reduce the extent and structure of riparian zones as well as bushclumps. Due to the frequency of fires and denudation of the vegetation, the soils are exposed to the sun and as a result are baked hard and are capped with a hard layer inhibiting seedling survival. Such man-made fires tend to occur during the dry winter months, thus stimulating the grass to grow at a time when soil moisture is at its lowest, with the result that less robust species do not survive the hottest and driest months in spring, preceding the rains. Although some nutrients do return to the soil following fires, this does not replace the nutrients derived from rotting material and

associated protective cover of the soil, as well as helping to retain moisture following rains for longer periods of time.

2.7.2.3 The past and present impact of animals

Due to the low densities of grazing animals, the current impacts of animals on the vegetation are equally low, or non-existent in large areas. Whether overgrazing by free ranging wild herbivores ever occurred in the past, can only be speculated on. The possibility that overgrazing occurred during periods of drought, cannot be ruled out and may even be regarded as a drought-induced occurrence that should be regarded as 'normal'.

The biomass of indigenous large herbivores in conservation areas in other miombo woodlands is only about 20-30% of that expected at the same mean annual rainfall in African ecosystems with nutrient-rich soils. Specialist ungulate browsers are rare in these habitats and much of the biomass is normally made up of large bodied species such as elephant and buffalo and other grazers such as sable antelope. In the case of Coutada 5 where miombo woodlands make up only a relatively small (but not calculated) percentage of the vegetation, and where the sandy soils are probably richer than in true miombo woodlands, the potential to keep a much larger variety of herbivore species should be much higher that in 'real' miombo regions.

Large herbivores such as elephant, white rhino, buffalo, and zebra have the ability to bring about drastic changes in unutilized climax vegetation, and are termed Type I feeders. Species that decrease due to changes brought about by Type I feeders are termed Type II feeders and include roan, sable, tsessebe and waterbuck. The latter species, which require relatively open areas with nearby thickets for shelter, do not cause substantial change to vegetation composition and structure.

Species that increase in response to changes brought about by Type I utilization are termed Type III feeders, and include blue wildebeest and impala. Type III feeders have the ability to push the vegetation state induced by Type I feeders past the threshold point which would have resulted had Type III feeders been absent. Type IV feeders may increase due to changes brought about by Type I and III species, but have little impact on the vegetation. Examples of Type IV feeders include giraffe, kudu, black rhino, eland, and bushbuck.

An animal's basal metabolism (with the animal being at rest) is inversely proportional to body mass. Smaller animals, made up mostly of Type III and Type IV feeders have higher metabolic rates, higher relative maintenance requirements and lower absolute requirements than larger animals. They therefore have a high intake, select a diet of high nutritive value and have a high digestive efficiency.

Furthermore, the effects of herbivory on the habitat include a reduction in plant and litter cover, reduced fire probability, reduced fire intensity, nutrient enrichment through dung

and urine, soil compaction, trampling, reduced infiltration, increased runoff, and increased erosion on certain soils. This is particularly important in areas where animal movement is restricted by fencing, especially in relatively small fenced areas. In the case of Coutada 5, where a huge wildlife-wilderness block (maybe upwards of 200 000 ha) will be fenced, this potential problem should be alleviated or ruled out altogether by good management.

Herbivory results in compensatory growth by plants in the following ways:

- Under conditions of low defoliation, the plants compensate by just replacing lost tissue;
- Under moderate levels of defoliation and favourable moisture and nutrient conditions, overcompensation, with a resultant increase in plant production, may occur; and
- Under severe defoliation regrowth does not compensate and, if continued, causes desirable species to diminish while facilitating the establishment of those often more unpalatable species resistant to herbivory increases.

2.7.2.4 Defining carrying capacity for herbivores

The vegetation of the Coutada is currently totally under utilized due to a lack of herbivores. This includes both browsers and grazers. The absence of grazing animals promotes the establishment of more fire resistant grasses at the expense of more palatable but less fire resistant species. Following a burn herbivores tend to graze on the newly emerged grasses including those of lower palatability. Frequent fires do not allow for a build up of combustible material with the result that bush encroachment can take place.

The term ‘carrying capacity’, although widely used, is rather nebulous with many definitions, and is difficult to determine in heterogeneous environments experiencing variable environmental and resource conditions. The Large Stock Unit (LSU) has to date formed the basis of expression of ‘stocking rate’ and ‘carrying capacity’. The LSU uses the animal’s metabolic energy requirements and probable food intake, and comparisons between animals of different species are generated and expressed as LSU’s. While the principles of this approach are valid and useful under many circumstances (e.g. a single-herbivore cattle grazing system), the LSU is based on a heavy-bodied grazing ruminant (originally a 1 000 lb. ox) and does not take into account the feeding patterns (overlap) and digestive systems of different herbivores. In multi-herbivore systems this leads to confusion when calculating carrying capacity and stocking rates. Furthermore, the term ha LSU^{-1} assumes that systems tend to equilibrium (assuming stability and homogeneity), which is often not the case.

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build up of combustible material with the result that bush encroachment can take place, and thus directly impacts on the herbivore carrying capacity for Coutada 5.

2.7.2.5 System functioning

The dynamics of miombo woodlands, savannah, and mixed broadleaf deciduous woodlands, which form the major vegetation types of Coutada 5, have been described in detail over the years. Such a detailed description of the Coutada 5 vegetation is currently unfortunately not possible (see above), nor is it deemed critical at this moment. At a later stage, research projects including full vegetal analysis, will have to be considered. The involvement of tertiary institutions will be enlisted (see Part M below)

At the outset, however, it is imperative that a clear set of conservation objectives be set from which management goals may be defined, which has already been done (see elsewhere in this BBP).

2.7.2.6 International norms and policies

The proposed wildlife re-introduction program is in line with current international norms and policies as embodied in the World Conservation Union guidelines (IUCN, Species Survival Commission):

(1) Ecosystem restoration

One of the global biodiversity strategies of the IUCN is the restoration of degraded ecosystems and the re-introduction of species where necessary. This objective is also embodied in the objectives for Coutada 5, and is discussed in Part E of the BBP.

(2) Definition

The planned re-introduction of wildlife to Coutada 5 is in line with the IUCN definition:

> "An attempt to establish a species in an area which was once part of its historical range, but from which it has been extirpated or become extinct"

(3) Aim and objectives

The program is also compatible with the IUCN's re-introduction aims and objectives:

> Aims: " … to establish a viable, free-ranging population in the wild, of a species …. which has become …. locally extinct, or extirpated, in the wild"
>
> Objectives: "To enhance the long-term survival of a species; to re-establish a keystone species (in the ecological or cultural sense) in an ecosystem; to maintain and/or restore natural biodiversity; to provide long-term economic benefits to the local … economy …"

(4) Biological requirements

The planned re-introduction program also complies with the following IUCN guidelines (unless otherwise indicated):

- A feasibility study, based on historical records and experienced scientific advice, was undertaken
- The taxonomic status of the populations that were extirpated is not known; it would thus not necessarily be animals of the same race or subspecies that will be re-introduced, though every effort would be made to source the animals from known populations of the same race/subspecies.
- The void left by the extirpated species was not filled by other species.
- There are, with a few exceptions involving small numbers scattered over a large area, no remnant populations left of the species to be re-introduced.
- The success of the re-introduction program will be monitored.
- The Coutada will offer secure long-term protection.
- The habitat and especially the quality of the grazing of Coutada 5 are in general sufficient (and in some instances even excellent), to support viable populations of the to-be-reintroduced species in the long run.
- The reasons for the extirpation of the species from Coutada 5 will be eliminated.
- The source populations will be closely related genetically to the original native stock.
- The species that will be re-introduced are common elsewhere and the effects on donor populations will be negligible.
- The donor populations and the captured animals will undergo a veterinary screening process prior to being moved.
- The relocated animals will meet all veterinary requirements of Mozambique.

(5) *Socio-economic requirements*

The performance of AFWR in this regard should be regarded as more than adequate. Not only will the socio-economic requirements of the local communities be determined, analyzed and taken into consideration, but every effort will be taken to ensure that the local people regard the Coutada development, inclusive of the game reintroduction program, in a positive light. The preventative or remedial steps indicated in the various social action plans outlined below (see Part H), should ensure that the local project-people will be better off than before.

(6) Legal requirements

All legal requirements will be complied with.

(7) Planning and preparation and post-release activities

The program will be in compliance with all 14 of the IUCN planning, preparation and release guidelines as well as with the 10 post-release activities that are listed.

2.7.3 Carrying capacity calculations

2.7.3.1 Approach

The experience of in-house specialist conservation managers was harnessed during the planning exercise. Their assessment of the vegetation, of veldt condition, of carrying capacity and of a preferable species mix, led to defensible decisions on game re-introduction being taken.

2.7.3.2 Field Procedure

No quantifiable field assessments of carrying capacity for wildlife were undertaken. As was pointed out, historical records and the collective experience of career conservationists were pooled to arrive at a defensible estimate. This conservative estimate will in time be confirmed, or adapted if need be, by applying scientific methods to undertake qualitative assessments of the condition of the vegetative component of the habitat. The vegetative assessment procedures as described below, were nevertheless regarded as important, and were holistically applied.

2.7.3.3 The vegetation assessment

Refer also to the interim discussion of the vegetation of Coutada 5 as indicated above.

Vegetation type based on the dominant tree and grass species and land-unit type (a broad structural classification of vegetation) are important in determining suitable habitat for the species earmarked for re-introduction.

Soil moisture availability and soil nutrient status are critical in determining the structure and functioning of savannah systems, in that they affect the balance between trees and grasses and patterns of primary production and plant quality. The latter influence the kinds and extent of herbivory, animal impacts, and fire frequency and intensity that in turn affects soil moisture and nutrient availability.

Sandy soils such as those that dominate in the Coutada allow rapid infiltration and percolation through the soil profile, thus minimizing evaporation through the soil surface. Sandy soils have a potentially lower water holding capacity than clay soils, but most of the moisture present is available to plants. Sandy soils also show less fluctuation in plant available moisture between seasons because they hold higher proportions of soil moisture than clay soils.

It has been shown that as grass canopy cover decreases, so soil loss and rainfall run-off increase markedly. As the cover falls below about 25% so the surface run-off of water increases exponentially.

Grass tuft size and vigor may vary markedly within species and are important measurements that provide information on the stability, resilience and competitive status of species within the grass layer and between grasses and trees.

Utilization and grass standing crop is an extremely important issue in rangeland management. The grass layer can be kept in a vigorous condition as long as it is utilized in a way that allows it to grow and reproduce. Major changes in vegetation are often caused by the interactive influence of herbivory and fire. Herbivory interacts with fire spatially and temporally, with grazers being attracted to newly burned areas. Grazers in turn reduce fuel loads resulting in a lower probability of the area sustaining another burn. Herbivory is usually specific and confined to certain favored plant species and parts, and herbivore impact tends to be restricted in space but is more uniformly distributed in time. Fire on the other hand is periodic, can potentially extend over a large area, and is non-selective.

A number of vegetation parameters were regarded as important, and were subjectively assessed. These included vegetation types at the sites visited, soil condition, grass cover estimates, tuft size and vigor, the impact of fires, and if any utilization was noticed. No attempt was made to estimate the standing crop per hectare.

2.7.3.4 Herbivore suitability assessment

In multi-species systems it is important to determine the proportional contribution of specific herbivore species to the total stocking rate. Decisions in this regard considered the following for the species proposed for re-introduction to Coutada 5:

- The objectives of the Coutada;
- The type and proportion of forage available;
- The feeding habits of the species in question, and

- Habitat suitability based on a subjective five-point scale (1=very low to 5=very high).

2.7.3.5 A preliminary assessment of the carrying capacity of Coutada 5

The use of the terms ecological carrying capacity (the population size of an organism in an area as determined by the capacity of that area to support the individuals in that population and enable them to reproduce) and economic carrying capacity (the number of animal units per unit area of land that will achieve maximum animal production per unit input, but does not permit soil erosion or changes in the botanical composition that reduces the potential of the vegetation to produce animal products) have become almost standard practice. In large protected areas such as Coutada 5, management often use ecological carrying capacity to determine the numbers of herbivores that can be kept on the land, the premise being that the interaction between wildlife and their environment will lead to some sort of equilibrium being attained. In the case of Coutada 5, where maximal production of the released animals will be the objective, and where hunting will play a major role in the future use of the land, economic carrying capacity will be the choice at least for the immediate future, and probably beyond.

2.7.4 Results, Discussion and Recommendations

2.7.4.1 Vegetation Type and Land Unit

The vegetation types and land units were not specifically assessed in-depth, due to a lack of access and a lack of time. The preliminary vegetation types for Coutada 5 will only become clearer after completion of a second vegetation survey, which is planned for January-February 2014.

2.7.4.2 Grass cover

The grass cover has been estimated to be generally moderate to even excellent for Coutada 5.

2.7.4.3 Grass tuft vigor

The grass tuft vigor for Coutada 5, as can be expected based on the variety of soils being present, varies between low/poor and excellent.

2.7.4.4 Grass standing crop

Grass biomass is the biomass of grasses, forbs and sedges, i.e. the non-woody component of the vegetation, on the land in question. It is important because it indicates how much food is available for grazers, how much material there is for utilization by man and how much material there is for burning. Grass standing crop, however, is a crude measurement as not all species are acceptable to herbivores. It is therefore normally combined with composition, structure and vigor estimates to indicate the amounts of acceptable forage available for grazers. The grass standing crop for Coutada 5 has not been measured, nor accurately estimated, as was pointed out above. In future more detailed assessments are planned (see Part M).

2.7.4.5 Habitat suitability for large herbivores in Coutada 5

Habitat suitability assessments for Coutada 5, and more specifically the area intended to be developed as the core wildlife-wilderness zone, have been determined in general terms. It can be seen from the following (admittedly subjective) analysis that the habitat is largely medium to highly or very highly suitable, for the herbivore species on the re-introduction program. In some instances the size of the fenced area that would be available to them, allows selective species and/or bulk feeders to select the habitats that are most suited to them, whereas, if the area had been small. their habitat suitability rating would have been marginal or not suitable:

Buffalo	Highly suitable (the size of the to-be-fenced area contributes to this rating)
Elephant	Highly suitable (the size of the to-be-fenced area contributes to this rating)
Eland	Highly suitable (the size of the to-be-fenced area contributes to this rating)
Waterbuck	Medium to highly suitable (the size of the to-be-fenced area contributes to this rating)
Sable antelope	Medium to highly suitable (the size of the to-be-fenced area contributes to this rating)
Lichtenstein’s hartebeest	Medium to highly suitable (the size of the to-be-fenced area contributes to this rating)
Common reedbuck	Medium to highly suitable (the size of the to-be-fenced area contributes to this rating)
Hippo	Highly suitable in the Rio Save, elsewhere moderately suitable, provided that permanent pools can be established in the secondary rivers
Zebra	Highly suitable
Blue wildebeest	Highly suitable

Roan antelope	Highly suitable (the size of the to-be-fenced area contributes to this rating)
Kudu	Highly suitable (there are still some kudu to be found)
Nyala	Highly suitable (there are still some nyala to be found)
Impala	Highly suitable (there are still some impala to be found)
Bushbuck	Highly suitable, though the availability of their preferred habitat is restricted to riverine forests
Giraffe	Highly suitable (according to available records, giraffe never in historical times occurred north of the Rio Save; however, some older local people who have lived in the area their whole lives, are adamant that giraffe formerly did occur in what is today Coutada 5)

2.7.4.6 Carrying capacity assessments for Coutada 5

For Coutada 5 the economical carrying capacity approach (see above) will be applied. Preliminary results from subjective assessments undertaken by experienced personnel, indicate that the area has a medium to high herbivore carrying capacity. Until such time as more accurate assessments are possible, the management of Coutada 5 will err on the conservative side in estimating carrying capacities. The carrying capacity estimates applied at some cattle ranches to the south of the Rio Save, have also been considered.

The large size of the to-be-fenced core wildlife-wilderness zone (hopefully more than 200 000 ha), and containing a variety of different habitats (refer to the discussion on the vegetation above) will also allow the managers to carefully evaluate the condition of the grazing on a continual basis. Remedial steps can then be taken as and when necessary, without undue fears about the fenced zone being overgrazed. It must also be taken into consideration that the numbers of the to-be-released species will initially be far below the estimated carrying capacity, which will also grant the necessary leeway to the managers to adapt the initial estimates (a policy of adaptive management will be followed). It is furthermore highly likely that a few release camps will be constructed before the outer boundary fence of the core wildlife-wilderness zone is completed. The impact of the herbivorous animals re-introduced into these release camps, will provide valuable insights as to the accuracy of the estimated carrying capacity.

Given the above uncertainties and positives, the carrying capacity of Coutada 5, but especially the planned fenced wildlife-wilderness zone, has been estimated at 16 HA/LSU. Should the fenced area zoned for wildlife-wilderness uses, planned to be 210 000 ha in extent, be stocked to capacity a highly impressive 13 125 large stock units can be carried.

2.7.4.7 Guidelines for large herbivore and large carnivore re-introduction

The historical records, as well as personal discussions with both local and foreign old-timers who knew the area well, indicate that Coutada 5, in general terms, can be regarded as suitable for a large variety of plains- and big game to re re-introduced. These populations can be accommodated on a sustained basis.

Keeping the objectives of the Coutada in mind, herbivore and predator introductions should be aimed at (given in a rough order of priority):

- Re-establishing wild herbivores and carnivores which, according to available historical evidence, occurred in the area;
- Prioritizing the introduction of populations of "drawcard" species (e.g. elephant, buffalo and lion – but in line with the first point);
- Maintaining other species in densities that do not compromise the success of the "drawcard" species;
- Maintaining all herbivore populations at numbers, sex and age structures and proportions which will not compromise the vegetation, soil and hydrological integrity of the Coutada;
- Maintaining major carnivore populations at numbers, sex and age structures that will not compromise the prey populations;
- Ensuring that large enough numbers of herbivore and carnivore species are re-introduced to maintain the genetic diversity of these species; and
- Obtaining revenues from the sustainable utilization of surplus herbivores and carnivores to maintain the long-term economic viability of the project, to the benefit of the investors and the surrounding rural communities.

2.7.4.8 Herbivore and predator re-introductions

The following will be considered by AFWR during the execution of the re-introduction program:

- The conservative carrying capacity estimate of 16 ha/LSU will initially be adhered to;
- The carrying capacity estimate may be adjusted based on the actual situation (an adaptive management philosophy will be applied);
- The initial re-introductions of herbivores will be done in a number of holding- or release camps, whilst the outer perimeter is still being fenced;
- The holding camps will be large enough to rule out the necessity of the animals being fed;
- Water will be provided to the holding camps;
- The holding or release camp(s) for elephant will need to be electrified to ensure that the animals can not egress the site;

- Elephant kept in temporary holding camps will be released into the large area as soon as possible;
- Management action will be taken in the event of any signs of habitat degradation;
- Once the fencing of the outside perimeter (estimated to be about 185 kilometer in length) is complete, the internal fences of the holding or release camps will be removed;
- It will be endeavored to solicit donor assistance in fencing the area and procuring suitable species for re-introduction;
- The release of lions will be in a lion-proof camp(s) that will, for management purposes, be erected near the headquarters facility of AFWR;
- The released carnivores will need to be fed, but every effort will be taken to ensure that the lions in the camp(s) do not associate humans with the provision of food; suitable prey animals will also be released into the camps to ensure natural predation;
- The local communities will be kept abreast of developments through the Public Consultation and Disclosure Plan (PCDP, outlined below); and
- No re-introductions will be possible to areas where the household resettlement program for that area has not been satisfactorily completed.

A guideline for the re-introduction of herbivore species to Coutada 5

The following aspects are taken into consideration:

- The total size of the fenced core wildlife-wilderness block is estimated at 210 000 ha
- The areas outside of the fenced core zone are not taken into consideration
- The carrying capacity for herbivores is estimated at a conservative 16 ha/LSU
- The allocation of animals between the three feeding classes are as follows:
  - Grazers 60% of the LSU's
  - Browsers 15% of the LSU's
  - Mixed feeders 25% of the LSU's
- The total herbivore population that the 210 000 ha can sustainably support is 13 125 LSU's
- The division of LSU's between feeding classes is as follows:
  - Grazers 60% 7 875 LSU's
  - Browsers 15% 1 970 LSU's
  - Mixed feeders 25% 3 280 LSU's

Allocating the stocking capacity between species

An interim allocation of species to manage the terrestrial herbivorous wildlife within the initial stocking capacity as indicated above, has been undertaken as a desk exercise. The planned re-introduction of lion to an initial breeding camp(s), is not discussed here (see below). The estimated numbers at full stocking capacity, as well as the initial numbers that should ideally be relocated, are mentioned below. The huge extent of the re-

introduction program is clear from the figures provided. Should the program be successful, it will entail one of the largest wildlife-rehabilitation projects ever undertaken.

Specie	Numbers at full stocking capacity	Initial numbers to be introduced	Estimated annual production
Roan antelope	378	108	57
Sable	1 006	195	201
Hippo	365	120 + 245	18
Buffalo	3 020	858	362
Zebra	1 510	429	166
Blue Wildebeest	2 423	404	533
Waterbuck	1 293	368	194
Reedbuck	328	93	49
Lichtenstein Hartebeest	218	36	48
Bushbuck	306	48	70
Duikers	864	168	173
Giraffe	253	53	48
Kudu	1 479	40 + 189	340
Nyala	1 768	295	389
Black Rhino	121	60	10
Suni	1 174	390	153
Eland	838	130	193
Elephant	246	123	20
Impala	7 109	954	1 777
Steenbuck	1 476	228	339

Carnivore restocking

Since the sustainable use of the wildlife resources of Coutada 5 will have to ensure the profitability and thus the long-term viability of the project, it stands to reason that the major predators, most if not all of whom were extirpated due to the unsustainable practises of the past, will need to be re-introduced in a free ranging state.

The carnivore species to be re-introduced include lion, leopard, cheetah and spotted hyena. Initially, only lion will be released into a temporary breeding enclosure(s). Every effort will be taken to ensure that the lion do not become habituated by being fed by humans, prior to being released into the core wildlife-wilderness block where they will have to fend for themselves. The ultimate objective is to establish a totally free-ranging healthy lion population.

The other predator species mentioned above will probably be released directly into the fenced wildlife-wilderness block, but it is not altogether ruled out that some may also be temporarily released into holding camps.

Wildlife management and sustainable utilization plan

A preliminary wildlife management and utilization plan is included in Part D below.

2.7.5 Research and monitoring program

Refer to Part M for the future monitoring and research program with regards to the wildlife of Coutada 5.

2.8 DESCRIPTION OF MARINE BIOTA

No survey of the marine environment along the Indian Ocean coast of Coutada 5 has been undertaken, nor is such a survey planned for the near future. The following notes on marine biota for the Coutada 5 coast are thus based on data known from the Bazaruto Island chain and the San Sebastian Peninsula, due south of Coutada 5 in Inhambane.

Unlike the marine environment off the east coast of Bazaruto, where the main requirements for the formation of coral reefs are present, there are apparently no hard rocky substrates off the Coutada 5 coast to allow coral reefs to develop, even though the water is warm enough.

The ichthyofauna in the ocean off Coutada 5 is probably rich. It has been estimated that about 80% of all the fish families in the world are represented in the Bazaruto-San Sebastian area, with possibly more than 2 000 species to be found. However, the absence of coral reefs and sheltered bays off Coutada 5, will in all likelihood prevent such a diversity to be found locally. Most fishes in the area are of Indo-Pacific origin and many, especially migratory game fish species such as large sharks, may have wide ranges of occurrence.

Notable marine species that will probably occur off the Coutada 5 coast, include the following:

Whale shark *Rhincodon typus*
Giant manta ray *Manta birostris*
Marine turtles that probably occur: green turtle *Chelonia mydas,* loggerhead turtle *Caretta caretta*, leatherback *Dermochelys coriacea*, hawksbill *Eretmochelys imbricata* and the olive ridley turtle *Lepidochelys olivacea*. The absence of sandy beaches probably prevents turtles from nesting locally.

Marine mammal species that probably occur: dolphins (common dolphin *Delphinus delphis,* spinner dolphin *Stenella longirostris,* hump-backed dolphin *Sousa plumbea* and bottlenosed dolphin *Tursiops truncatus*), the humpback whale *Megaptera novaeangliae*. It is uncertain,

but unlikely due to the absence of sea grass, whether the extremely scarce and highly threatened Dugong *Dugong dugon* occur off the local coast.

Whale species that should occur include the humpback whale, fin whale *Balaenoptera physalus,* minke whale *B. acutorostrata,* sperm whale *Physeter macrocephalus* (further offshore), killer whale *Orcinus orca* and the southern right whale *Balaena glacialis.*

Mangrove swamps: The extensive mangrove swamps growing on the intertidal mud flats along the coast, form an important community of plants and animals. Specialized mangrove species such as the mud hopper *Periophthalmus sobrinus* and two mangrove snails, *Cerithidea decollata* and *Terebralia palustris,* may occur. Species lists will be compiled in due course.

2.9 CURRENT UTILISATION STATUS OF MARINE BIOTA

No empirical data is available for the levels of utilisation of marine biota along the Coutada 5 coast. However, if the levels of utilisation of marine biota along relatively densely-settled coastal areas to the south of the Coutada in Inhambane, for example along the Vilanculos coast, are to be extrapolated to Coutada 5, then it is almost a foregone conclusion that the local levels of utilisation have reached unsustainable levels. Should this indeed be true, the marine species that are utilised will in time be exhausted and the marine habitat seriously degraded. The management of Coutada 5 will have to take cognisance of this likelihood.

CHAPTER B3: OVERVIEW OF BIODIVERSITY CONSERVATION IN MOZAMBIQUE, WITH SPECIAL REFERENCE TO THE COUTADA SYSTEM

3.1 BIODIVERSITY CONSERVATION IN MOZAMBIQUE

3.1.1 Protected areas of Mozambique

(1) Transfrontier Parks and Transfrontier Conservation Areas

There are currently three Transfrontier Conservation Areas (TFCA) in Mozambique, with the Great Limpopo Transfrontier Park, including the Limpopo National Park in Mozambique, the world-renowned Kruger National Park in South Africa and the Gonarezhou National Park in Zimbabwe, being the most well-known. This TFCA was proclaimed in 2004 and boasts an area of almost 8,5 million hectares. However, plans are afoot to further increase this huge TFCA by firstly enlarging it to include certain communal lands, and to extend it towards the east by including both the Banhine and Zinave National Parks and also Coutadas 4 and 5, to the north of the Rio Save. A conservation area of some 100 000 km² (three times the size of the Netherlands), a truly magnificent achievement, will thus come into being. It should be noted that Zinave National Park lies diagonally opposite Coutada 5, and directly opposite Coutada 4, to the south of the Rio Save. The Kruger National Park in South Africa will thus, should these ambitious aims indeed come to fruition, link up with the Indian Ocean (see discussion below).

The other two TFCA's are the Lubombo Transfrontier Conservation Area – Peace Park (a joint venture between South Africa, Mozambique and Swaziland proclaimed in 2000 and with a total area of 417 000 ha) in the extreme south of the country, and the Chimanimani Transfrontier Park with Zimbabwe (proclaimed in 1999, with an area of 205 000 hectares). However, it would seem as if a number of these areas are unfortunately troubled with various teething problems.

(2) National Parks

Mozambique currently boasts six national parks:
Banhine in Gaza (700 000 ha), Bazaruto National Park in Inhambane (160 000 ha); Gorongosa National Park in Sofala (537 0000 ha); Quirimbas National Park on the Quirimbas Archipelago and islands in Cabo Delgado (750 000 ha) and Zinave National Park in Inhambane (diagonally opposite Coutada 5, to the south of the Rio Save, 600 000 ha. All these parks were largely decimated of both infrastructure and wildlife during especially the civil war of the 1980's, but are today gradually bouncing back.

(3) Reserves

The country's reserves are the following:
Gilé National Reserve on the coast in Zambezia (210 000 ha); Maputo Special Reserve (7 000 ha); Marromeu Buffalo Reserve in Sofala (150 000 ha); the huge Niassa National Reserve in Niassa (4,22 million ha); Pomene National Reserve on the coast of Inhambane (20 000 ha); Chimanimani National Reserve in Manica (640 000 ha) and lastly the Maputo Protection Area (a marine protection area). Most of not all of these reserves, with the possible exception of certain species in Niassa National Reserve in the far north, were decimated during the civil war period. Most of them are today making a positive but slow recovery.

(4) Wildlife Utilisation Areas (Coutadas)

There are 12 operational Wildlife Utilisation Areas or Coutadas in Mozambique. Their average size is 420 000 ha, with Coutada 5 being the largest at 686 800 ha. (For further discussion, see below)

3.1.2 The Convention on Biological Diversity in Mozambique, with reference to Coutada 5

Mozambique signed the United Nations Conference on Environment and Development (UNCED, the so-called Rio [de Janeiro] Conference), in 1993 and ratified the convention in 1995. Resulting from this ratification, Mozambique (through the Ministry for the Coordination of Environmental Affairs, MICOA), drew up a Strategy and Action Plan (SAP) for Biological Diversity in Mozambique, with an implementation timeframe of 10 years. This SAP contains five parts: an introduction; a description of Mozambique's

biological resources and heritage, an analysis of the opportunities for and constraints on the conservation of biodiversity, a strategy for the conservation of the biodiversity and lastly an action and implementation plan. The development and utilisation of Coutada 5 will have to take place according to the guidelines provided by these documents.

The main objectives of the Strategy and Action Plan (SAP) can be summarised as follows:

(1) To comply with the requirements of Article 6 of the Convention on Biological Diversity (CBD), i.e. to develop a national strategy to reflect the measures stipulated in the CBD
(2) To identify issues for which national priorities and immediate urgency exist
(3) To provide a basic implement to ensure that all policies relating to biodiversity are executed properly

The strategy identified four priority action areas:

(1) The conservation of biodiversity, including the protection of habitats
(2) The sustainable use of the various components of biodiversity, including the sustainable management and use of natural resources in the disciplines of agriculture, forests and fauna, fishery resources and tourism, emphasising the implementation of integrated management plans and the participation of local communities in the development process
(3) The evaluation of the impacts of development activities
(4) Formal and informal capacity-building, research and awareness-raising, thus ensuring the implementation of those actions that were identified as priorities.

The Mozambican SAP includes a variety of conservation objectives (eight in total), of which the following four are of direct relevance to the planning, development, management and utilisation of Coutada 5:

(1) To identify and analyse the components of biodiversity and their relationships within ecosystems, as well as the processes and activities that can have an adverse impact on them
(2) To determine the state of conservation of species in Mozambique, and to identify and implement appropriate conservation measures for threatened and endemic species
(3) To determine Mozambique's state of conservation of ecosystems and habitats, and to identify and implement appropriate conservation and ecosystem measures
(4) To recover and rehabilitate degraded ecosystems and, where applicable, to develop species recovery plans

With regards to the sustainable use of biodiversity resources, nine objectives were identified, of which the following six are directly appropriate to Coutada 5:

(1) To promote the sustainable use of flora resources (both timber end non-timber) to the benefit of all concerned, including the local communities

(2) To guarantee the sustainable use of agricultural resources, inter alia to improve the living conditions of the rural population
(3) To guarantee the rational usage of wildlife, so that it can contribute to the well-being of rural populations and the development of Mozambique
(4) To promote the sustainable use of fisheries resources, again for the benefit of the local populations and of the maintenance of biodiversity
(5) To ensure that the tourism industry is based on respect and sustainable use of biodiversity
(6) To promote sustainable development in areas adjacent to protected areas, thus providing additional protection for protected areas

As will be evident from this BBP, and especially Coutada 5's mission and objectives as embodied in this BBP, Coutada 5 will strive to comply with not only the spirit of the CBD, but also the grass-roots objectives as mentioned above.

3.1.3 Implementation of the Convention on Biological Diversity in Mozambique

As can be expected in a country where a sizeable proportion of the GDP (estimated by some sources to about half the annual budget) is dependent on outside donor aid, Mozambique met with mixed success in implementing the stated national objectives of the CBD's local strategy and action plan (SAP).

With regards to the general state and trends of biodiversity conservation, and major threats facing the conservation of these resources, negative trends were noted for the conservation of mangrove forests (a decrease of about 12 000 ha from 1979 to 1990), a gradual decrease of area covered by coral reefs, and a decrease in seagrass beds. Sizeable areas of mangrove forests can be found along the entire coastline of Coutada 5. The mangrove swamps has not been surveyed, but the total area in and immediately to the west of the Coutada is estimated to be at least 15 000 in extent.

A number of key actions were taken to support the country's three main objectives as outlined in the national SAP, viz. the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising there from. Highly positive steps taken include the increase in the percentage of protected areas from 11% to 16%, primarily due to the formation of three new National Parks (Limpopo, Quirimbas and Chimanimani); the establishment of three new Transfrontier Conservation Areas (TFCA's: Lubombos, Great Limpopo and Chimanimani); the formation of the Marromeu Complex (containing the Marromeu Buffalo Reserve and including the neighbouring Coutadas or hunting concessions – a development with possible positive implications also for Coutada 5, if a similar venture can be arranged locally); proposals for a further two new TFCA's and the imminent proclamation of the Ponta do Ouru area in southern Mozambique, on the border with South Africa, as an area of marine conservation. Certain new laws, such as the Environmental Law (20 of 1997), provide a legal framework for amongst others the participation of local communities in matters pertaining to biodiversity conservation.

Four Centres for Sustainable Development (CSD) were created to deal with research, the implementation of projects and to provide technical assistance on environmental issues. None of these centres, however, are near Coutada 5: they occur near Xai-Xai in Gaza (focusing on coastal zone issues), in Manica (focusing on the conservation and management of natural resources – which may be of particular importance to Coutada 5); in Nampula (concentrating on urban issues), and lastly the Centre of Marine and Coastal Environments in Pemba in the north (Cabo Delgado). Mention is made of the extensive involvement of the IUCN in funding conservation projects in almost all provinces. Coutada 5 will take cognisance of this fact.

Some areas for national concern, where no or only limited progress has been made, include the need for strengthening the institutional capacity, the need to establish a centralised database, to strengthen the capacity for inspection and environmental monitoring, the need to strengthen the role of environmental education (of which Coutada 5 can take note), as well as to address emerging issues such as an increase in man-animal conflicts.

The government identified three possible future scenarios to indicate the relationship between poverty and biodiversity conservation: Scenario A will lead to an accentuated decrease in biodiversity due to maintaining the status quo with regards to deforestation and an increase in the human population; Scenario B will lead to a dramatic decrease in biodiversity due to a number of market factors (such as industry, bio-fuels, and intensive agricultural practises), with Scenario C leading to a slight but unavoidable decrease in biodiversity (this preferred scenario will entail intensification of subsistence agriculture and thus improving productivity; rehabilitation of erstwhile biodiversity-rich denuded habitats; sustainable use of resources; better enforcement of environmental laws, and the possible use of agroforestry to decrease the dependence on natural vegetation for firewood and charcoal.). As will be evident form this BBP, Coutada 5 will be in a position to assist with attaining these national biodiversity goals.

3.1.4 Overview of the biodiversity of Mozambique

For the sake of brevity, only a few of the more important factors, i.e. those with a (possible) direct current or future application in Coutada 5, will be listed:

(1) A total of five phyto-geographic have been described, with Coutada 5 falling in the Swahilian-Maputaland Regional Transitional Zone
(2) Of the seven main vegetation types of Mozambique, the coastal regions of Beira province fall in the coastal mosaic unit, with Mopane woodland, Undifferentiated woodland, Coastal mosaics (for eg. mangrove forests) and patches of Miombo woodland being the most prominent.
(3) A total of 4810 spermatophyte (seed producing plants) and 103 pteridophyte (vascular plants with neither seeds nor flowers; reproduction takes place via spores) species have been listed for Mozambique

(4) Identified threats to the venation are primarily man-induced (anthropogenic) and include slash-and-burn agriculture, encroachment on open areas, uncontrolled fires and non-sustainable uses of especially fuel wood for domestic energy purposes.
(5) The list of terrestrial fauna include an impressive total of 4271 terrestrial species, with 72% represented by insects (a probable underestimation), 17% by birds, 5% by mammals, 4% by reptiles and 2% by amphibians.
(6) The last national wildlife census undertaken in 2008 indicated a severe, and in some instances a catastrophic, reduction in numbers. This reduction is blamed on the past political instability (with a massive decline during the civil war period), uncontrolled hunting, and inoperative conservation areas. New policies that are implemented should, at least partially, redress this unfortunate situation, at least within protected areas. Coutada 5, an area where the intention is to manage and utilise the wildlife in a sustainable manner, can perhaps benefit by these national objectives.
(7) In the period between 1970 (the beginning of the civil war) and 2008, virtually all the major species decreased dramatically in numbers. Elephant, for example, previously widespread, are today restricted to certain areas, including Niassa National Reserve in the north (in Niassa province) with a healthy population. The current total number for the country is given (2008) as more than 22 000, with the vast majority in Niassa and Cabo Delgado. The decline of the national buffalo herd was even more catastrophic: the 2008 estimate was only 5 717, whereas the Marromeu area alone reputedly previously harboured a herd of some 60 000 animals. The population of Sable antelope, especially in the north of the country, seems to be healthy with an 2008 estimate of more than 32 000 animals.
(8) The following large mammal species, are listed as local red data species (threatened) for Mozambique: White rhino *Ceratotherium simum;* Lichtenstein's hartebeest *Damaliscus lunatus;* Sitatunga *Tragelaphus spekei;* Black rhino *Diceros bicornis;* Giraffe *Giraffa camelopardalis;* Mountain reedbuck *Redunca fulvorufula*, Roan antelope *Hippotragus equinus* and Cheetah *Acinonyx jubatus.* None of these species occur in Coutada 5 though it is highly likely that all, with the exception of the Sitatunga, were once widespread locally.
(9) A unique marine mammal species with considerable cause for concern, and which may well be found along the coast of Coutada 5, is the Dugong *Dugong dugon*. The last 'stronghold' of this threatened mammal on the east coast of Africa is along the Inhambane coast, with some 200 reputedly counted in 2007 in the Bazaruto Archipelago complex.
(10) Generally, Mozambique has taken huge steps during the last decade towards safeguarding and rehabilitating the country's biodiversity, including the establishment of an official institutional framework. The 'new' Ministry for the Coordination of Environmental Action (MICOA) will play a leading role in this regard. Other Ministries with a direct involvement in environmental matters (including the Coutada system) are Tourism, Agriculture, Fisheries, Mineral Resources, Public Works and Habitation, Science and Technology, Finance, Foreign Affairs and Cooperation, Trade and Industry, Planning and Development, Education and Culture, and finally Health. The environmental/biodiversity functions of each of these ministries have been spelled out.

(11) MICOA also spelled out the following 'tools' that could be used in biodiversity conservation (and thus also in Coutada 5):
   a. The global legal instruments (including international treaties) pertaining to biodiversity
   b. The main regional instruments relevant to biodiversity conservation, and ratified by Mozambique
   c. The main Mozambican legal instruments (laws) relevant to biodiversity
   d. Government adopted programs such as PARPA (Action Plan for the Reduction of Absolute Poverty); NEPAD (New Partnerships for Africa's Development); National Environment Fund (FUNAB); Non Governmental Organizations (NGO); Small Grant Program (SGF), founded by the Global Environment Facility (GEF); Worldwide Fund for Nature (WWF); United Nations Industrial Development (UNIDO); and finally the environmental projects run by the Eduardo Mondlane University in Maputo.

(12) Coutada 5 can, and should, establish links to as many as possible of the abovementioned institutions and facilities.

3.1.5 Biodiversity Conservation in Coutada 5: the past and current situations

Formal and effective biodiversity conservation in Coutada 5 is currently almost non-existent. The previous concessionaire, whose contract was cancelled recently by the government, made no discernible or effective efforts to firstly rehabilitate and secondly sustainably utilise the extremely denuded wildlife resources of Coutada 5. During his tenure of some ten years, it would seem as if the situation actually worsened. The new holding company, *Africa Future Wildlife Restoration Lda* (AFWR), has set out to urgently address this unfortunate situation, as is evidenced from the stated Mission and Objectives of the project to rehabilitate Coutada 5, and to develop it in accordance with relevant Mozambican policies and legislation. AFWR thus literally start the rehabilitation project with an unfortunate, but nevertheless real, inherited backlog of 10 years. Due to the immensely expensive rehabilitation projects and development activities, spanning biodiversity conservation in its broadest sense, that will need to be launched in the near future, AFWR accepted the principle that close cooperation with international, national and regional role-players will need to be established as a matter of urgency.

3.2 THE COUTADA SYSTEM, IN RELATION TO THE OVERALL CONSERVATION ESTABLISHMENT IN MOZAMBIQUE

As was pointed out above, there are currently 12 operational Coutadas, or hunting blocks, in Mozambique, of which Coutada 5 at almost 7 000 km² is the largest. The Coutadas are included in the current figure of 16% of Mozambique, that is dedicated to some formal form of protection, contributing an impressive 42 000 km² (5,24% of the country). The Coutadas thus play a major role in Mozambique's determination, to turn around the current unsatisfactory state of biodiversity conservation in the country. However, it is unfortunately also clear that at least some of the Coutadas, Coutada 5 included, have been so denuded of wildlife that any future role they can play, would be totally dependent on successful wildlife rehabilitation programs being implemented. It needs to be pointed out at this stage that

sourcing of suitable species to replace the lost wildlife, will be extremely difficult and very costly.

3.3 MAJOR CONSTRAINTS IN THE REHABILITATION OF THE BIODIVERSITY OF THE DEPLETED COUTADAS, INCLUDING COUTADA 5

3.3.1 The Bush Meat Menace

No data other than anecdotal is available for the current level of bush meat harvesting in Coutada 5. AFWR will henceforth monitor the situation, but it can safely be predicted that the current level of utilisation of the already depleted biodiversity, specifically the wildlife resources, would be unsustainable. Various recent reports were received of poachers leaving the Coutada, with a variety of illegally harvested carcases of especially small game being clearly visible. From the air, clear indications are that 'hunting camps' have been established in various localities in the Coutada.

In Coutada 9 in Manica province, situated to the northwest of Coutada 5, a comprehensive study on the menace posed by illegal hunting (the so-called bush meat trade), revealed some disturbing facts. Illegal hunting has resulted in an alarming decline in wildlife numbers in Coutada 9, resulting in significantly reduced potential earnings from trophy hunting, and a concomitant reduction in the potential for wild meat production. The researchers estimated that the current wildlife numbers for Coutada 9 is less than 10% of what they should be, and furthermore determined that a number of species have been extirpated altogether. This situation has, in addition to the obvious biodiversity impacts, negative implications to the safari operators insofar as revenues generated are concerned, necessitated the need to run expensive anti-poaching programs, incurred a direct loss of revenue for the local communities and, finally, the loss of an estimated annual 86 tons of 'wild' meat that would normally have been allocated to the local communities.

In Coutada 9, as would undoubtedly also be the case in Coutada 5, the bush meat-trade (or poaching) problem is unfortunately directly linked to the number of local people residing inside the boundaries of the Coutada. The core wildlife zone for Coutada 9 (2120 km²) comprise only 56% of the surface area, whereas the densely populated settlement areas (565 km²) and multiple-use zone (1087 km²) offer little in the line of biodiversity conservation. In the multiple-use zone, 75% of trophy fees accrue to the local people. However, due to the virtual absence of wildlife in this buffer zone, hunting there is almost non-existent. Some settlements occur even in the core wildlife zone, but these are in the process of being relocated. This voluntary relocation meet with the approval of the government (Department of Agriculture) and the local chiefs, and inter alia include compensation in the form of resettlement costs, as well as the building of a school and a health clinic.

The wildlife populations in Coutada 9, notwithstanding the serious ongoing problem with poaching and the denuded state of the biodiversity, are seemingly at a much healthier level than is the case in Coutada 5. This can probably be attributed to an effective anti-

poaching program (an average of 28 game scouts are employed) and, possibly, a larger base wildlife population to start with, compared to Coutada 5. In Coutada 9 the game estimates for 2010 include 333 Elephant, 119 Lichtenstein's hartebeest, 552 Kudu, 96 Sable antelope and 338 Warthog, as well as numerous other species found in smaller numbers. The current corresponding figures for Coutada 5 are unknown, but it seems as if there are no elephant, sable antelope or Lichtenstein's hartebeest left, with possibly only the odd straggler buffalo allegedly occasionally moving through.

3.3.2 Human settlements

As was pointed out above, human settlements in Coutada 9 led to only 56% of the Coutada being available as a core wildlife area. The corresponding situation in Coutada 5 will probably not be nearly as bad, but sizeable human populations occur in the town of Machanga and its environs, along the open areas leading to Divinhe in the east, all along the Rio Save, and some smaller (but seemingly increasing) communities along the main road, the EN1. An unknown number of family settlements are found scattered over large areas of Coutada 5, with the northwestern area relatively densely settled. The total human population of Coutada 5 may be more than 50 000, of whom the great majority will reside in the major settlements. The planners and management of Coutada 5 will have to take cognisance of this fact, and will have to come up with innovative solutions to engage the communities as active role-players, and partners in the venture, whilst resorting to more environmentally friendly land-use practises. This prerequisite is dealt with elsewhere in this BBP.

3.3.3 Woodfuel harvesting

Another widely-acknowledged threat to biodiversity conservation in Mozambique, is the over utilisation of natural woodfuel resources. In certain areas, for example around all the major cities, the unsustainable use of woodfuel and charcoal for domestic purposes, have led to situations whereby the natural woodland landscape has been altered significantly, and in most cases probably irreversibly.

The bulk of the rural population in Mozambique, as well as the urban poor, are dependent on woodfuel as their principal source of household energy. In total, the contribution of woodfuel to the country's household energy needs, can be estimated at about 80%. In the Coutada 5 region, this figure will probably be close to 100%. At an estimated annual consumption per household of 5000 kg of woodfuel in Coutada 5, it stands to reason that the situation will have to be closely monitored. Again, the management of Coutada 5 will have to be innovative, and come up with solutions that will not only address the energy needs of the people living within the confines of the Coutada, but will ultimately ensure that the valuable biodiversity resource is not prejudiced to an irreversible level.

3.3.4 Hardwood logging

Indications are that illegal hardwood logging takes place on an increased scale in Coutada 5. This problem will be addressed as soon as possible, although the sheer size of the

Coutada and the inaccessibility of most of the logging areas, are serious impediments in addressing the problem. Access to the logging sites are seemingly from without the Coutada, especially from the north.

3.4 ECOLOGICAL SIGNIFICANCE OF COUTADA 5 IN A REGIONAL, NATIONAL AND INTERNATIONAL CONTEXT

3.4.1 The Regional Significance

With the exception of Zinave National Park, situated south of the Rio Save and diagonally opposite Coutada 5, there are no other formally protected areas in the vicinity of Coutadas 4 and 5. To the south (to the east of Vilanculos) lies the Bazaruto National Park, in Inhambane province, comprising the main islands of Bazaruto, Benguerra, and Magaruque. To the immediate south of the Bazaruto National Park, on the northern extremity of the San Sebastian (Quewene) Peninsula, lies the privately developed Vilanculos Coastal Wildlife Sanctuary. The Sanctuary, whilst in essence a commercial development, has an avowed biodiversity conservation function. However, the Bazaruto National Park and to a lesser extent also the Vilanculos Coastal Wildlife Sanctuary (VCWS), concentrate on the conservation of marine resources. The main islands are relatively densely settled by humans, thus making the meaningful conservation of terrestrial species problematic. The soils of the VCWS are nutrient poor, thus limiting the carrying potential for especially large ungulates.

The Zinave National Park, of some 600000 ha, or somewhat smaller than Coutada 5 at 687 000 ha, has been severely denuded of wildlife during the long-drawn-out civil war of the 1980's, and has since then been making only a very slow recovery. The accent of the park's conservation effort is on terrestrial species. It seems as if a large number of human settlements are today to be found inside the park. During an aerial survey on the distribution of elephant, undertaken by a team funded by the German Frankfurt Zoological Society in 2009, scattered human settlements were identified in almost all the regions of the Park. Isolated small groups of cattle were also located. By contrast, no sign were found of any elephant, neither in nor near the Park. In an effort to speed up the Park's rehabilitation project, during 2011 50 zebras were re-introduced from South Africa, with a relocation of zebra, impala, buffalo and elephant planned for 2012.

Coutada 5 can and should play a major role in the rehabilitation of the region's seriously degraded terrestrial wildlife biodiversity. To properly achieve this goal, however, will take some time, and will be an expensive undertaking. However, Coutada 5 can immediately make a significant contribution towards the protection of the natural environment against environmentally degrading agricultural practises, and therefore the conservation of the vegetation and the associated smaller wildlife species that can still be found. The successful achievement of the stated mission and objectives, will be a huge step forward. Coutada 5 thus already makes a significant contribution towards biodiversity conservation on a regional level.

3.4.2 The national significance

Being the largest Coutada in Mozambique, and with the prospect of being developed in a manner fully consistent with the aims of Mozambique's national biodiversity conservation framework and objectives, Coutada 5 will undoubtedly play a major conservation role on a national level. However, it should be realised that the rehabilitation of the severely depleted terrestrial wildlife, will both be time consuming and extremely expensive. Furthermore, the possible non-availability of suitable species, in adequate numbers, for relocation may detract from the overall success achieved in the rehabilitation of the Coutada.

Most of the other Coutadas, for example to the north in Manica province, and certainly also the adjoining Coutada 4, are hamstrung by a paucity of wildlife, and threatened by negative anthropogenic influences. Thus, even though the Coutadas contribute a total of some 5,24% to Mozambique's network of protected areas, their immediate role and contribution should not be overestimated.

3.4.3 The international significance.

Notwithstanding the paucity of terrestrial wildlife in Coutada 5, any protected area of 687 000 ha will play a meaningful role on the international arena, provided that it is properly protected, developed and utilised – as will be the case for Coutada 5, should the AFWR objectives be realised. In the South African context, for example, Coutada 5 would be ranked as the third largest protected area. In Mozambique itself, Coutada 5 ranks 5th in size after the Limpopo National Park, the Niassa Game Reserve, the marine Quirimbas National Park and Banhine National Park.

Should the planned eastward extension of the Limpopo TFCA materialise, Coutada 5 and its sister Coutada 4, will gain tremendously in importance on an international scale (see below).

CHAPTER B4: THE CURRENT AGRICULTURAL ENVIRONMENT IN MOZAMBIQUE

4.1 THE AGRICULTURAL SCENARIO IN MOZAMBIQUE

4.1.1 Role of agriculture in the national economy

In 1990, during the latter stages of the civil war, Mozambique was considered to be the poorest nation in the world. Since the peace accord came into being in 1992, the economy has changed to a market-oriented economy. Together with donor assistance and a stable political scene, the economy has been growing considerably. Despite such positive indications and trends, the country nevertheless remains one of the poorest on the world scene.

Agriculture remains, albeit at a gradually diminishing level, one of the mainstays of the economy, with (together with fisheries) a 21,1 percent contribution to the Gross Domestic

Product in 2004. The United Nation's Food and Agricultural Organization (FAO), however, pointed out that the agricultural contribution has stabilised at 29% since 2002. This share ranks third after services and industry. The agricultural sector is furthermore an important source of foreign exchange, with a US $103 million contribution in 2003.

The availability of land cannot be regarded as a possible limiting factor for agricultural production. It is estimated that 61,7% of the total land area is suitable for agriculture, whilst only a small percentage (probably still less than 6%) is cultivated. Despite this low figure for cultivated land, about 61% of the population is actively involved with agriculture. About 96% of agricultural production takes place on small subsistence farms, totalling no less than 3,2 million smallholder units. Due to the low standard of the techniques employed, and the almost total absence of modern inputs, the crop yield in Mozambique is lower than in other African countries. A contributing factor to this low yield is the poor quality of seeds that are used. In Coutada 5, even though it is a formally protected area, small-scale subsistence family farming would also be the mainstay of the local economy. The situation in Coutada 5 would thus in all likelihood be on a par with the least developed rural areas of the country (see below). The continued comparative poor yield notwithstanding, increased agricultural yields lowered the rural poverty percentage from 69% of the population in 1996, to 54% in 2003.

4.1.2 National agricultural development strategy: stimulating smallholder agricultural growth

The main objective of Mozambique's agriculture policy, is to reduce absolute poverty according to the Poverty Reduction Plan (PARPA II). This policy strives to strengthen governance, improve human capital and enhance economic growth, primarily through integrating the agricultural sector and the rural economy with the national economy.

Any future growth in the agricultural sector will be dependent on remedial actions being taken, in order to curb the unsustainable sources of agricultural growth. The need to improve farming practises is paramount. Since the late 1990's, improved agricultural technologies have only played a minor role: less than 10% of smallholder farms use fertilizer, animal traction or small-scale irrigation.

A major plus factor in stimulating agricultural growth, is the positive macroeconomic environment in the country. Annual growth during the last decade has frequently exceeded 9%. However, the high cost of capital makes it almost impossible for smallholders to obtain credit. This problem is exacerbated by the fact that, notwithstanding the huge per capita involvement in agriculture, only about 4% of the national budget is allocated to agriculture.

There are numerous other constraints to agricultural growth, most of which situ-situ apply to the Machanga district and thus also to Coutada 5:

(1) The poor road network, with a density of only 32 km of roads per square kilometre. The unit costs of providing roads to the sparsely populated rural areas are high.

(2) The irrigation potential is largely unexploited.
(3) Institutional development of ministries, including the Department of Agriculture, is low, with trained and experienced staff at a premium.

The Government of Mozambique (GoM) follow a two-pronged approach in promoting agricultural growth:

(1) For smallholder farmers, producing food grains and other products for the local domestic market, enhancing productivity is critical
(2) For the growing number of cash-crop farmers participating in out grower schemes, their bargaining power need to be strengthened. The establishment of producer organizations can greatly contribute in this regard.

A supportive environment needs to be created in order for smallholder farmers to increase their production:

(1) Basic infrastructure needs to be developed or provided, such as roads, transportation, storage facilities, and operational markets
(2) Irrigation needs to be expanded. This will diversify income, and will reduce drought-induced risks.
(3) All rural expenditures will need to be included in government budgets
(4) A good business environment should be promoted. This should address corruption, reducing costs to register a business, easing the application of some regulations, maintaining flexible labour regulations and facilitating access to suitable land.

The need for closer cooperation between government, donors and the local people (or civil society) has been pointed out as an ideal to strive for. For example, any lack of coordination between donor agricultural programs, which is apparently the case, will lead to a waste of money and increased frustrations across the board. The need for dramatically improved extension programs has also been highlighted.

Sofala province falls into Zone 5 of the national agro climatic regions allocation. Region 5 is the so-called low altitude region of Zambezia and Sofala, being a strip of the coastal plain of varying width. The soils are generally sandy, alternating with heavier texture soils such as Fluvisols and Vertisols. The average production of agricultural crops is nevertheless low: maize between 600 – 800 kg/ha; sorghum 500 – 750 kg/ha, with cassava at 6,000 – 8,000 kg/ha rendering a better yield.

Whilst agricultural production will on a macro scale be subservient to biodiversity conservation in Coutada 5, it will nevertheless be of extreme importance to the many hundreds of smallholder farmers that will operate within the confines of the Coutada. The management of Coutada will thus have to take real cognisance of agricultural problems, shortcomings and developments. Indeed, according to a study by the FAO (UN), households in Sofala (as in Inhambane and Cabo Delgado) are most likely to depend on hunting, gathering and fishing to access food.

CHAPTER B5: THE CURRENT AGRICULTURAL ENVIRONMENT IN COUTADA 5, WITH POSSIBLE FUTURE DEVELOPMENTS

5.1 AGRICULTURE IN COUTADA 5: IMPLEMENTATION PRINCIPLES AND DEVELOPMENT FOCUS

The sustainable small- (community) and large- (agricultural investors) scale agricultural development program that are planned for Coutada 5, will dovetail with the broader objectives for the Coutada, and with the other community development projects as embodied in the BBP. Its main elements will thus include the following:

- Organic farming methods (aquaculture and/or permaculture and/or sustainable conservation farming) will be employed and will bring the Sustainable Agricultural Program/Plan (SUSAP, see below) in line with the overall biodiversity objectives for Coutada 5.
- Sustainable livestock ranching techniques will be employed by large-scale commercial enterprises, as well as by local entrepreneurs
- A holistic and integrated approach to the development of the local people (the system of Community-based Natural Resources Management CBNRM will be implemented) and their social infrastructure will form the backbone of the SUSAP.
- The recognition that agriculture (and fishing) play a central and anchor role to the well-being of the local communities
- An appreciation by AFWR of the possible social disruption, also affecting subsistence farming, to certain communities occasioned by the development of the Coutada.
- The promotion of environmental awareness amongst the local communities, and the need for them to grasp and apply the principle of sustainable resource utilization in agriculture
- Job creation through direct participation of farmers in new production ventures, and through indirect economic activities arising out of the farming (and possibly also fishing) enterprises that will be set up.

The Coutada 5 agricultural initiative would be comparable to a Sustainable Agricultural Program and would, of necessity, be a long-term undertaking. As in any other long-term development program, it would thus be essential to structure, implement and review the progress in the light of long-term objectives.

During the initial stage of the Sustainable Agricultural Plan, the main focus will be on applied research (to obtain baseline data), initiation of the program, enlisting the aid of a specialist, and the formation of farmers associations. For practical reasons, more than one such an association will be needed; the small isolated farming community of Jofane upstream on the Rio Save, for example, is about 120 km from Machanga. It is expected that during this stage, an appropriate farming system will be finalized (in consultation with the farmers association), including sustainable crop and animal production models. This aspect is dealt with below.

The agricultural development process that is outlined below takes cognizance of the current lack of baseline data, and sets up a procedure and phased system that will in time lead to the identification and selection of a fully appropriate and feasible SUSAP.

5.2 NATURAL AGRICULTURAL RESOURCES OF COUTADA 5

Although the major soil units of Coutada 5 still need to be surveyed, the predominantly sandy soils will probably be relatively poor in nutrients. However, in general the indications are that with a mean annual rainfall of about 800 mm, the close proximity of the perennial Rio Save, and linked to the tropical/sub-tropical climate, the areas that would be zoned for extensive livestock ranching and high-intensity production systems on smallholdings, would be eminently suited to sustainable agricultural ventures.

5.3 CURRENT AGRICULTURAL PRODUCTION PRACTISES AND IMPACTS

The social impact assessment that is currently being undertaken, will provide data on the current agricultural practises in especially the planned core wildlife-wilderness zone, as well as the agriculture practised on the lands where the to-be-resettled households will be resettled.

In the absence of empirical data, the following superficial observations will have to suffice. This section will be updated in the 2nd Iteration of the BBP, planned for the first quarter of 2014. The observations do not apply to the area around Machanga; the cattle farmers between Divinhe and Machanga are also excluded, as are the households along the coast who rely primarily on fishing to make a living.

- The great majority of the smallholder farmers practise subsistence agriculture. Surpluses are apparently bartered for other fresh produce.
- The vast majority of the farmers are poor
- The lands cultivated per family are on average less than 1 ha in extent
- The preferred method of cultivation is slash-and-burn, producing very poor yields
- The quality of the seeds used are poor
- The two most important crops are maize and cassava
- Fruit trees are almost absent
- Cattle are absent, with some chickens and goats being kept.
- Freshwater fishing is important along the Rio Save, as well as in the pools of the Muar, Bunga and Ripembe rivers.
- Most of the farmers also probably practise (illegal) hunting, the gathering of wild honey and the making of palm wine.

The area is very sparsely settled by humans, with the result that the impacts of the unsustainable slash-and-burn production practise are limited in extent on a global scale, though locally noticeable and destructive. The most important negative impact of the smallholder farmers will undoubtedly be their cumulative impact on the environment, and the total decimation of the wildlife herds through unsustainable harvesting.

5.4 ACCESS OF LOCAL PEOPLE TO LAND FOR AGRICULTURAL PURPOSES

Although Coutada 5 is, as is the case with all the other Coutadas, recognised as a formal protected area, the people living legally on the land have a long-established and inalienable vested interest in using the natural resources. It seems, though, as if a number of people have settled 'illegally' in the Coutada in recent times; they apparently moved in during the tenure of the previous concessionaire, when virtually no control was exercised. The legal status of these people must still be determined. The management of Coutada 5 took cognisance of these facts, and planned and zoned the available land accordingly.

In principle, it is accepted that most of those areas that have historically been farmed by subsistence farmers, will continue to be zoned for agricultural purposes. There are nevertheless a few exceptions to this rule: the increasing prevalence of slash-and-burn (swidden) cultivation activities along the EN1, will have to be curtailed. These activities take place on the border of what would become the future core wildlife area, and the ideal would be to resettle these farmers and their families to other more suitable areas. Such a resettlement program would need to be voluntary, failing which the farmers will have to be accommodated where they are, but with more eco-friendly farming techniques being employed. Furthermore, those isolated settlements that are thinly scattered over large areas of the core wildlife areas, will have to be resettled. In the last instance, care will be taken to ensure that more farmers do not settle in the area. The resettlement action plan is dealt with elsewhere in this document.

The guiding principles for developing the agricultural resources of Coutada 5, may be summarised as follows:

(1) The ideal would have been to rehabilitate the whole Coutada as a proper protected area, with the conservation of biodiversity being paramount. Given the extremely denuded state of the wildlife populations, such an ideal would prove to be impractical, or more correctly even totally impossible, to implement. Other more conventional uses of the natural resources thus had to be considered.
(2) The current farmers will, by and large, be allowed to remain in the localities where they currently are, except those that are found in the core wildlife-wilderness area.
(3) Should resettlement of smallholder farmers be needed, such a resettlement will be handled by AFWR in such a manner that the farmers resettle voluntarily
(4) Care will be taken to prevent an influx of people from far afield to the core agricultural development areas
(5) Modern high-intensity small-scale agricultural techniques will be promoted
(6) Extensive livestock ranching enterprises, involving investment farmers from neighbouring countries, will be developed to the east of the EN1

5.5 INVOLVEMENT OF LOCAL COMMUNITIES IN AGRICULTURAL VENTURES IN COUTADA 5: ESTABLISHING HIGH INTENSITY SMALLHOLDER FARMING ENTERPRISES

The ecologically destructive practise of slash-and-burn- or shifting agriculture, especially along the EN1, but even more importantly at the few localities in what is to become the core wildlife-wilderness area, will have to be curtailed. AFWR will have to take the lead in investigating possible other environmentally friendly techniques (for example high intensity, high production, ventures on smallholding; see discussion below). The Coutada will thus in effect become a Multiple-use Resource Protected Area (MURPA).

5.6 INVOLVEMENT OF PRIVATE INVESTORS IN AGRICULTURAL VENTURES IN COUTADA 5

The extremely denuded state of the biodiversity resources of Coutada 5, with the general exception of the vegetative component and smaller animals, would make it virtually impossible to regard the entire Coutada 5 as a to-be-rehabilitated unit of 687 000 ha. Such an undertaking would be prohibitively expensive, whilst the general the paucity of wildlife in other regions of Mozambique, would rule out an extensive and large-scale relocation program.

The principle of multiple-use will thus need to be implemented, otherwise considerable areas of Coutada 5 may be laid waste as time goes by. To establish such a multiple-use resource protected area (MURPA) in Coutada 5, thus makes sound ecological and financial sense. The livestock ranching investors that will hopefully be enticed to invest in Coutada 5, will make money available to AFWR to re-invest in rehabilitating the core wildlife-wilderness area.

5.7 AGRICULTURAL AND RURAL DEVELOPMENT OPPORTUNITIES AND CONSTRAINTS

5.7.1 Opportunities

Whilst recognizing the threats posed by the antiquated and unsustainable farming techniques that are still used, it should be acknowledged that farming is an established and respected culture in the region. Most if not all of the current farmers grew up to become farmers, and in many instances that is probably what they really want to do. They only need some guidance and assistance to become successful farmers. The natural resource potential of the land is high enough to allow sustainable agricultural practices under properly managed conditions.

The current development of Coutada 5, will most probably create larger markets for produce and commodities to be sold by the local population. Improved infrastructure and services (access, transport, market etc) that will result from the development of Coutada 5, will facilitate sustainable rural development, including agriculture, in those areas zoned for agricultural practices.

5.7.2 Constraints

Some serious constraints that the local small farmers may encounter and will have to cope with, include the following: poor infrastructure; lack or inadequacy of production inputs; inadequate level of training and experience of farmers; depletion of the natural resources by current present farming practices; lack of an extension service to farmers; shortage of permanent employment opportunities and lack of additional income generation activities. AFWR will have to take the lead in alleviating these problems, otherwise the ideal of sustainable agriculture may never be realised.

5.8 KEY ISSUES INFLUENCING FUTURE AGRICULTURAL DEVELOPMENT

The following issues, whether in isolation or collectively, will have a determining influence on the future development of the agricultural project in Coutada 5:

- The possibly nutrient-poor sandy soils of the area have a relatively *low potential* for rain-fed cash crop production, as presently practiced by the farmers.
- The relatively low *experience and training* levels of the present farmers with regard to agricultural production will influence the rate at which development can take place.
- Proper *training* of subsistence smallholder farmers in employing new techniques, will have to be undertaken
- The implementation of the *organic farming technique* (permaculture, such as aquaculture or aquaponics) must be regarded as a long-term investment in sustainable resource use, and may not in the short term adequately address the urgent need to enhance soil fertility.
- The *poor regional infrastructure* in terms of roads, transport and communication will have a negative effect on the cost and availability of production inputs (seeds and pesticides) as well as the sale of produce (market access).
- The exact *number of people and families* residing in the Coutada are unknown, but it is evident that the available resources of the agricultural zones can only sustain a finite number of families. Future human population growth, whether natural or an influx from outside the area, may negatively affect the sustainability of the agricultural base.
- The establishment of effective *community structures* to enable the communities and AFWR to enter into a co-management or collaborative management system, would be a prerequisite for a successful community agricultural project.
- *Development support* by AFWR will be necessary to make the area socio-economically sustainable. The nature and duration of this support will have to be long-term, to ensure that an acceptable level of self-sustainability would indeed be reached.
- The in-house *agricultural extension capacity* of AFWR is low, and outside assistance will have to be solicited
- Adequate *funding* from external sources will have to be raised, in order to implement new farming techniques

PART C: MISSION, OBJECTIVES, MANAGEMENT PHILOSOPHIES AND THREATS: COUTADA 5

CHAPTER C1: MISSION OF COUTADA 5

The mission for Coutada 5 is as follows:

To plan, develop, manage and utilise Coutada 5 in such a manner that the seriously depleted biodiversity resources will be rehabilitated over time, and in line with relevant Mozambican laws and policies, thus allowing sustained consumptive and non-consumptive use of these resources, whilst at the same time pursuing sustainable agricultural developments on certain sections of the Coutada, and simultaneously acknowledging the need to involve the local communities in a positive, meaningful and mutually beneficial manner.

CHAPTER C2: OBJECTIVES OF COUTADA 5

The following objectives are directly based on Mozambique's national objectives for the conservation of biodiversity, adapted to the local realities and needs in Coutada 5, and will constitute the focus for the rehabilitation and development of Coutada 5:

2.1 DIVERSITY OF OBJECTIVES

The diversity of the project objectives that follows is a reflection of the complexity of what needs to be done and of the magnitude of the venture. Even though the Coutada has been in existence for decades, the current resources baseline is such that the re-development will effectually start from scratch, except where healthy habitats are concerned. To rehabilitate such a huge protected area is almost a daunting task, especially since the rehabilitation has been entrusted solely to a private investor. Furthermore, it must be borne in mind that a multitude of social aspects and socio-economic realities need to be incorporated. Every effort has been made to bring the objectives in line with the relevant national biodiversity conservation objectives, as reflected in the National Strategy and Action Plan for the Conservation of Biological Diversity in Mozambique.

2.2 BIODIVERSITY-BASED CONSERVATION OBJECTIVES

(1) Objective 2.2.1 (National objective 1.1): To identify and analyse the various components of biodiversity, their actual relationship in the ecosystem, as well as processes and activities that may negatively impact on them.
(2) Objective 2.2.2 (National objective 1.2): To determine the conservation status of the species in the Coutada, and to identify and implement appropriate rehabilitation measures
(3) Objective 2.2.3 (National objective 1.4): To determine the conservation status of the Coutada's different habitats, and to identify and implement appropriate conservation and management measures
(4) Objective 2.2.4 (National objective 1.7): To identify, recover and rehabilitate degraded habitats and to develop and implement species recovery plans

2.3 OBJECTIVES RELATING TO THE SUSTAINABLE USE OF THE COMPONENTS OF BIODIVERSITY

(1) Objective 2.3.1 (National objective 2.1): To promote and ensure the sustainable and integrated use of flora resources, ensuring benefits for those involved
(2) Objective 2.3.2 (National objective 2.2): To promote and ensure the sustainable use of the agricultural resources, with the accent on implementing new technologies for smallholder agricultural production systems
(3) Objective 2.3.3 (National objective 2.3): To rehabilitate the denuded wildlife of Coutada 5, and to guarantee the subsequent sustainable use thereof
(4) Objective 2.3.4 (National objective 2.4): To promote the sustainable use of fisheries resources within the ambit of Coutada 5, with the accent on freshwater systems

2.4 TOURISM OBJECTIVES

(1) Objective 2.4.1 (National objective 2.6): To ensure that a viable tourism industry is developed, based on the sustainable use of the biodiversity, and with a regional developmental accent

2.5 SOCIAL OBJECTIVES

(1) Objective 2.5.1: To ensure that the implementation of all the abovementioned objectives, irrespective of their nature, take the needs and aspirations of the local communities *wherever possible and/or feasible,* into consideration. The local communities residing in the Coutada would need to be accommodated in a fair and equitable manner, inclusive of the involuntary resettlement program

2.6 ADMINISTRATIVE AND FISCAL OBJECTIVES

(1) Objective 2.6.1: To ensure that the development and rehabilitation of Coutada 5 will, in the long run, be in line with universally accepted principles pertaining to profitability of a private-sector venture
(2) Objective 2.6.2: To ensure that the development and rehabilitation of Coutada 5, take place in such a manner that it would be conducive to enlist the aid of appropriate donor agencies
(3) Objective 2.6.3: To ensure that the standards applying to the development and rehabilitation of Coutada 5, are at such a high level that the moral (and hopefully even more direct) support of the Government of Mozambique, would be forthcoming
(4) Objective 2.6.4: To operate the finances of Coutada 5 in line with Generally Accepted Accounting Practises

2.7 OBJECTIVE: COLLABORATION AGREEMENT WITH COUTADA 4

Objective 2.7.1: To investigate the possibility of entering into a collaboration agreement with the adjoining Coutada 4, and to, if approved, establish a formal collaborative unit

comprising the two Coutadas, whilst retaining full contractual independence (see discussion below)

2.8 OBJECTIVE: PUBLIC-PRIVATE PARTNERSHIP: ZINAVE NATIONAL PARK

Objective 2.8.1: To investigate the possibility of entering into a formal collaboration agreement with the Government of Mozambique, thus establishing a public-private partnership including Coutadas 4 and 5, as well as Zinave National park.

CHAPTER C3: MANAGEMENT AND CO-MANAGEMENT PHILOSOPHIES, AS APPLIED TO COUTADA 5

3.1 MANAGEMENT

No protected area such as Coutada 5 can be successfully developed and rehabilitated unless the costly venture is managed effectively, and in line with modern management practises and principles. The primary focus of management attention would be focused on realising the objectives set out above. To this must be added the management of the multitude of secondary tasks and activities that will be outlined in the various operational plans (OP's).

Management intervention would need to constantly adapt to changes in both the macro- and micro-environments pertaining to Coutada 5. This will entail practising the universally accepted principle of adaptive management, in other words the ability to apply sound management principles, whilst at the same time being flexible enough to accommodate changes.

3.2 CO-MANAGEMENT AND COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT

All the biodiversity conservation objectives of Mozambique, as well as a host of other official policies dealing with the various fields of the country's social fabric, have, to a greater or lesser extent, a direct bearing on the development and rehabilitation of Coutada 5. AFWR thus will need to acknowledge the need to regard the local communities as active long-term partners in the venture. Much has been published world-wide on community-based natural resources management (CBNRM), which will essentially form the guiding principle of the involvement of the people living in Coutada 5. However, given the nature of the Coutada 5 concession and the contract with the government, such a CBNRM-principle will have to, of necessity, lean towards the responsibility, and indeed the accountability, of AFWR to not only take the lead, but to remain, in all respects, the prime force behind the venture.

There are numerous benefits to be had by involving the local communities. First and foremost is that a virtuous circle will be established, in which the local people become volunteer guardians of the project. Such a guardianship will be based on the fact that Coutada 5 will, if the principle is implemented correctly, be viewed by them as being co-owners of the venture. As soon as they regard the development as 'ours', and not merely as

another impingement on their rights by a group of foreigners (the 'theirs'), the battle for the minds of the people will have been won.

In selecting a strategy, AFWR chose a combination between the pure top-down approach where the company will essentially drive the project, and a bottom-up approach, where the local people have a strong and continuing involvement. The model selected by AFWR for Coutada 5, harness the advantages of both systems by going as far along the path of full partnership as is consistent with the achievement of the Coutada 5 objectives. On a continuum ranging from full AFWR control on the one hand to full control by the community on the other, the AFWR model would lie at about a value of 7:10, with the envisaged inputs from the company being 7, and the expected inputs of the community at 3.

This formal sharing of authority and responsibility between AFWR and the local people, would entail a system of joint management of the renewable resources of the Coutada, and is universally known as the principle of co-management, with important elements of the system of community-based natural resources management being included. The terrestrial biodiversity management plans for Coutada 5, as embodied in this BBP as well as in the numerous operational plans, will build on the proven elements of a management partnership: firstly the *context* for the development partnership will need to be established, then followed by launching the partnership by means of an acceptable *process*, followed by an *agreement* that will clarify all the essential elements of management (and their acceptance by the people), and finally the management structure or *institution* that will be set up to implement the agreement. How this principle will be achieved, is discussed below.

CHAPTER C4: PRINCIPAL THREATS

The principals of AFWR acknowledge the following possible threats to the development and rehabilitation of Coutada 5, and will strive to either remove these threats, or else to minimise any unavoidable negative impacts:

- Political stability, for the past twenty years one of the main driving forces behind the gradual upliftment of the Mozambican economy, has recently perhaps come into question, due to organised attacks on civilians in Sofala, apparently by rogue rebels with a political agenda. However, it is to be hoped that the disagreements and/or misunderstandings that led to the attacks, will be solved amicably, and with no further negative impacts on the development of the country and of Coutada 5.
- Should AFWR not succeed in getting the local communities on board, the future of the entire venture may be at risk. The previous concessionaire of Coutada 5 apparently made enemies of the people that could have safeguarded the future of his project. This directly led to the cancellation of his contract, and probably also to the current management of Coutada 5 being regarded with suspicion by the local people.
- The management of Coutada 5 fully realise the importance, as well as the magnitude, of the task that has been entrusted to their care. To execute this colossal venture according to the plans, will require not only specialised dedication, but also access to huge external financial and biodiversity resources. The availability of especially the latter cannot be predicted with any certainty at this early stage.

- It is possible that all the areas where land-mines were placed during the civil war, have not been cleared. AFWR will take the matter up with the local government.

PART D: CONSERVATION, MANAGEMENT AND UTILIZATION OF THE BIODIVERSITY RESOURCES OF COUTADA 5, INCLUDING AGRICULTURAL VENTURES

CHAPTER D1: THE BIODIVERSITY OF COUTADA 5 IN PERSPECTIVE

The second survey of the biodiversity of Coutada 5 is scheduled for early 2014, when more meaningful data on the biodiversity should be available. In the meantime, the following general observations will have to suffice (refer also to Part B above):

- As the largest of the officially protected Coutadas, Coutada 5 should play a meaningful role in the conservation of the depleted biodiversity resources of Mozambique
- The major wildlife species of Coutada 5 were over-utilised to such an extent, that most species became locally extinct.
- Unsustainable use of the biodiversity unfortunately continue to this day
- The impressive variety of habitats, though, escaped largely unspoilt, and provide a suitable foundation for the general rehabilitation of the Coutada, and specifically for the restoration of the depleted wildlife resources
- The habitat provides ample space for a large variety of species, including the major predators, to be re-introduced.
- The wildlife of the whole region suffered from a similar catastrophical reduction in numbers. The neighbouring Coutada 4 and the Zinave National Park to the south of the Rio Save are today no better off than Coutada 5.
- A rehabilitated Coutada 5 will be of major conservation importance. It will be indicative of the ability of the private sector such as AFWR, in collaboration with the government, to turn an ecological catastrophe around into a highly positive and meaningful conservation triumph.

CHAPTER D2: SOIL AND SUBSTRATE CONSERVATION AND MANAGEMENT IN COUTADA 5

2.1 PRINCIPLES AND POLICIES

The deep sandy soils of most of Coutada 5, could normally present a serious threat to the conservation of such sensitive and vulnerable soils. The generally very level topography of Coutada 5 fortunately mitigates this potential threat. Erosion caused by surface run-off of water, even during high-intensity rainfall events, are thus limited in extent. In the more undulating landscape along the Rio Save, unacceptable levels of soil disturbance may well become a problem and will have to be closely monitored. Management actions will thus be directed at preventing, or at least minimizing the effect, of any activity or land use which could result in interference with natural dynamic processes.

2.2 MANAGEMENT OBJECTIVES

The specific soil and substrate management objectives for Coutada 5 are:

- To maintain the structural and ecological integrity of fragile soils on the banks of the Rio Save, and to identify it as an area of special concern.
- To maintain and control all man-made structures such as roads and landing strips, in a state that will not deleteriously affect natural systems or biota.
- To identify any eroded or unstable areas that may warrant special attention.
- To implement an ecologically friendly system of organic agriculture.
- To ensure that livestock ranching takes place within the limits of the Coutada's established carrying capacity for herbivores

2.3 THREATS

Threats to the conservation of the soils of Coutada 5 are limited, but do include the following:

- The instability of the soft sand in certain localities jeopardizes the construction of roads and will necessitate strict control of vehicular activities.
- Poorly designed, sited or constructed buildings and other structures, especially those on unstable and/or fragile areas.
- Unsustainable agricultural activities

2.4 MANAGEMENT PRIORITIES

The primary management priorities for soil and substrate management of Coutada 5, would be the following:

- Apply proper EIA principles for any structures that may impact negatively on the soils or substrate.
- Implement management actions that will ideally prevent or rule out the threats mentioned above, or at least mitigate the potential negative effects.
- Closely monitor the situation, in order to take preventative steps if necessary

2.5 MANAGEMENT OPTIONS AND ACTIONS

Soil management options that will be considered, and mitigative actions that will be taken, include the following:

- The extent of the road network on the more fragile soils of Coutada 5, will be limited to those that are absolutely necessary.
- The condition of all roads will be monitored to detect any degradation, and corrective measures will be taken as and when necessary.
- Any vehicular activity on the sensitive coastal wetlands and marsh systems is prohibited. (Vehicle tracks may act as moats, or may funnel the advancing or receding water to form channels and may thus cause irreversible erosion)

2.6 MONITORING

Monitoring will lie at the basis of AFWR's management of the soils and substrates of Coutada 5

2.7 OPERATIONAL PLANS

Operational Plans will, if necessary, be prepared to deal with specific steps to prevent soils degradation.

Planning action: Prepare Operational Plans if necessary

CHAPTER D3: CONSERVATION, MANAGEMENT AND UTILISATION OF MARINE RESOURCES IN COUTADA 5

3.1 PRINCIPLES

As has been pointed out, the conservation of marine resources possibly falls, at least partially, outside the scope of AFWR's mandate to develop, manage and utilize Coutada 5 in a sustainable manner. Nevertheless, it would seem as if the coastal and marine resources along the Coutada 5 shoreline, are not sustainably utilized, nor are they effectively protected. AFWR may thus, in consultation with the relevant local authorities, be obliged to ascertain that the coastal and marine environments of Coutada 5 are utilized in a sustainable manner, in order to maintain (or rehabilitate) essential ecological processes and life-support systems. This ideal, though, would be subordinate to a host of other terrestrial shortcomings that will need to be addressed.

3.3 MANAGEMENT OBJECTIVES AND PIORITIES

No management actions involving marine or coastal resources will be undertaken by AFWR, unless routine monitoring surveys should indicate that management interventions would be imperative, in order to prevent catastrophic collapses of marine species or systems. In such an event, AFWR will not be equipped to deal with the matter alone, and a collaborative approach involving other role-players, will need to be followed.

CHAPTER D4: CONSERVATION, MANAGEMENT AND UTILISATION OF FRESH WATER AQUATIC RESOURCES AND SYSTEMS

4.1 PRINCIPLES

Since no formal surveys of freshwater aquatic resources have been undertaken as yet, AFWR is not fully aware of any current problems with regards to the conservation and utilization of freshwater resources. Furthermore, no species lists are currently available. It would seem, though, as if roving fishermen are heavily utilizing fresh water fish species occurring in numerous pools of the Muar, Bunga, Ripembe and Gorongosa rivers, and may have had irreversible impacts on any endemic or threatened species that may have occurred there. The situation will be closely monitored.

4.2 CONSERVATION AND MANAGEMENT OBJECTIVES AND PRIORITIES FOR FRESHWATER AQUATIC SYSTEMS

The overall management objective would be to preserve the physical, chemical and biological integrity of the freshwater aquatic systems, including wetlands, associated with Coutada 5. Depending on the levels of use of freshwater fish species, as determined by future monitoring surveys, an in-depth survey of freshwater resources may be undertaken. Management interventions will be dictated by the results of such a survey. Once the extent of the core wildlife area has been determined, all consumptive use of the fish species found in natural bodies of water in such an area, will be prohibited or regulated, at least until such time as sound information becomes available. The presence of dangerous big-game species in the core wildlife areas, will obviously rule out casual visitation and fishing by unauthorized persons.

Bearing the above in mind, one of the main functions of AFWR with regards to the freshwater aquatic systems of Coutada 5, would be to identify the important ecological issues relevant to these systems. The following principal criteria apply to the selection of such ecological issues:

- Naturalness: The least impacted wetlands have the highest conservation value.
- Habitat and species diversity: Wetlands with greater diversity have a higher conservation priority.
- Extent: In general, larger sites contain greater diversity and are more resistant to changes, simply because they cover a larger area and are more likely to contain a greater variety of habitats.
- Rarity: Species or habitats that are rare or occur outside of their normal distribution at a particular site are of high conservation priority.
- Fragility (vulnerability): Some species have very specific requirements and are vulnerable to changes in their environment.
- Representativeness: The full range of variation in a region should be protected.

4.3 FRESHWATER RESOURCES SUSTAINABLE UTILISATION PLAN

Once the shortcomings in AFWR's current knowledge of the Coutada's freshwater resources have been overcome, a Freshwater Resources Sustainable Utilization Plan (FRSUP) will need to be compiled. The preparation and implementation of such a plan, will hinge on determining a practical implementation process, whereby all the relevant processes and procedures are identified, and then dealt with in sequence.

CHAPTER D5: CONSERVATION, MANAGEMENT AND UTILIZATION OF FLORA: COUTADA 5

5.1 PRINCIPLES AND POLICIES

The policy for vegetation management of Coutada 5 will be to prevent if possible, but at least minimize further negative man-induced impacts on the vegetation, especially in the

agricultural areas, and to ensure that herbivory impacts are in accordance with the calculated grazing capacity for the sanctuary (see Part B)

Special management attention will be focused on the conservation of special preservation areas, bushclumps (termitaria), wetlands (pans and marshes), dambos, possibly sensitive areas with mangroves, and the salt marsh communities.

5.2 MANAGEMENT OBJECTIVES

The following management objectives are based on general principles, and should be regarded as provisional. After the follow-up survey that will be undertaken in early 2014, more directly applicable objectives may be formulated. The interim vegetative management priorities can be summarised as follows:

- To conserve the plant biodiversity resources at community and species levels in the long term, and to prevent the regression in the status of any plant species or communities due to human impacts or activities.
- To ensure that adequate management attention is given to maintain the status, or improve in the case of specially identified species, of any endemic, rare or threatened plant species, and the control of alien invasive vegetation.
- To closely monitor the effect of the reintroduced herbivores on the vegetation in general and on vulnerable plant communities and species in particular.
- To regulate and monitor the effect of development actions or activities on the vegetation, and to ensure that adequate impact assessments and biophysical surveys are undertaken and mitigative actions implemented.
- To monitor the effects of slash-and-burn crop production on the vegetation
- To closely monitor the effect of fires on vulnerable species and communities such as bushclumps, and to investigate and implement an applied burning program and fire control system, as would be necessary to maintain fire-dependent plant communities, as well as to increase the quality of the grazing for herbivores.
- To regulate, as far as is feasible but definitely in the core wildlife-wilderness area, the introduction into Coutada 5 of all plants, especially exotics.
- To monitor and regulate the use of indigenous plants in especially the core wildlife-wilderness area by local communities and wildlife block investors

5.3 THREATS

A number of real and/or potential treats have been identified, and are addressed in the BBP:

- Uncontrolled wildfires, especially man-made fires that are lit for purposes other than the maintenance of the fire-dependent communities.
- Uncontrolled and/or insensitive physical developments in sensitive areas, especially by local communities
- Possible unsustainable use of plant resources especially wood, palm wine production and thatching.

- Possible future unsustainable use of certain species and/or communities by the to-be-reintroduced herbivores.

5.4 MANAGEMENT PRIORITIES AND ACTIONS

5.4.1 Special preservation areas

Preliminary observations indicate that the Rocky ridges and outcrops which occur at Buffalo Camp and westwards, as well as some Riparian zones, a representative sample of Termitaria and certain Pans fall within what could be construed as having a higher conservation value than the remainder of the area. The Rocky ridges are very restricted in extent, and have plant species and communities which are absent from the greater Coutada. Similarly the Riparian zones, Bushclumps and Pans are also limited in extent and are important refugia for many faunal species as well as exhibiting unique plant communities. The so-called Baobab Valley, with 76 mature baobabs growing in an area of about eight hectares, will also be considered for management as a 'special preservation area'.

Planning action: Prepare an OP for possible special preservation areas. (after completion of the early-2014 surveys)

5.4.2 Herbivory

The reintroduced wildlife, especially the major species such as elephant and buffalo but also short grass feeders, may cause an overexploitation of the more palatable and nutritious vegetation of the open grassy areas and seasonal wetlands in the core wildlife-wilderness block. The herbivory impacts on these sensitive areas may prove to be unsustainable, in which case corrective measures will have to be employed.

5.4.3 Managing and minimizing anthropogenic impacts

In the almost total absence of herbivorous animals, virtually all the currently noticeable impacts on the vegetation appear to be anthropogenic. Initial management should therefore be aimed at reducing such impacts.

5.4.4 Utilization of indigenous vegetation

The development of traditional infrastructure on Coutada 5 rely, at least as far as the local communities are concerned, to a large or even total extent, on the use of local building materials. The utilization of local timber for the erection of the game proof perimeter fence around the core wildlife-wilderness area may prove to be unsustainable. This situation will be closely monitored, and advance surveys will be undertaken to ensure that any use is sustainable.

5.4.5 Alien vegetation

The distribution of alien plants is restricted to some of those relatively restricted areas sparsely settled by man, and is not considered to be a problem.

5.4.6 Mangroves

No surveys have as yet been undertaken in any of the mangrove communities. The conservation status of these communities is thus not known.

5.4.7 Plant nursery

In order to assist investors and developers to obtain the right plants to rehabilitate areas disturbed during construction, or to be planted at bush camps and lodges, plants specific to the Coutada may have to be propagated. This requires that provision for a small nursery may have to be made, constructed and operated by a motivated person from the local communities. The use of such plants would be mandatory and not optional, and they would be sold to the developers. The nursery may possibly be incorporated in the agricultural development plan as is described below.

5.4.8 Roads and airstrips

It is important to site roads, and to a lesser extent also airstrips, where the impact on sensitive plant and animal communities will be least. This means avoidance of ecotones, seepages, dune forest, salt marshes and mangroves, and compliance with the EIA's.

5.4.9 Fire management

- *Burning program*: Due to the time constraints and lack of baseline data that faced the compilers of this BBP, it was not possible to investigate the need for and to prepare a burning program. The impact of fire on the area has already been discussed (see Part B). Fire will be an essential management tool for AFWR in meeting the needs for both the fauna as well as the flora. A proper burning program will need to be prepared and implemented, initially at least only for the core wildlife-wilderness zone. The burning program will need to create a mosaic of conditions, with a burning frequency of every 2 -4 years, or according to the build up of moribund material. Depending on the objective burns may be "hot" or "cold", the former used to control woody vegetation and the latter to reduce the effect on such vegetation. Cold burns are usually implemented following rain, when the vegetation does not burn with an intense heat. Burning should not take place on windy days as such fires cause extensive damage to bushclumps and forest fringes.

- *Firebreaks* are essential to control wild and set fires in the Coutada. With the assistance of aerial photographs, firebreaks can be planned for maximum effect according to the objectives of the burning program.

- *Fire records*: AFWR will ensure that accurate records of all fires inside the core wildlife-wilderness area, planned or otherwise, are kept. These will consist of a fire record sheet and a fire map. The record will include the extent of the fire, date, time, weather conditions, intensity of the fire, actual or assumed cause of the fire, and an account of any suppressive actions that were taken.

5.4.10 Photographic monitoring of vegetation:

Prior to the re-introduction of the first large mammals, it would be prudent for AFWR to take a series of fixed-point photographs of different vegetation communities, in order to assess possible changes that may take place as a result of the re-introduction, and the associated management practices. This could be used as an early warning system for management techniques to be amended as necessary, and would assist in executing the policy of adaptive management.

Planning: Prepare an OP for photographic monitoring of the vegetation

CHAPTER D6: CONSERVATION, MANAGEMENT AND UTILIZATION OF AVIFAUNA: COUTADA 5

The avifauna of Coutada 5 has provisionally been described in Part B. It should be noted that the description was based on the results of a very brief survey undertaken in June 2013. The data is thus very incomplete. A follow-up survey is scheduled for early 2014.

It is inevitable that the follow-up survey will necessitate some changes to the avifauna chapters of this BBP, and will thus result in an updated conservation and management section.

6.1 MANAGEMENT OBJECTIVES

6.1.1 Rationale

The following specific avifauna management objectives must be regarded as reflecting the current rather limited knowledge of the avifauna of Coutada 5. This provisional list of species and management objectives will be broadened as and when additional data becomes available. Changes to the avifauna chapters of the BBP will inevitably follow once the result of the follow-up survey become available.

6.1.2 Specific avifauna management objectives

At this stage the only viable management objective with regards to avifauna, is to undertake an effective follow-up survey, in order to obtain better data on which to base management decisions.

6.2 MANAGEMENT PRIORITIES, OPTIONS AND ACTIONS AND MONITORING

This section will only be prepared and included in the BBP after the survey of early 2014 has been undertaken.

CHAPTER D7: CONSERVATION AND MANAGEMENT OF TERRESTRIAL FAUNA: COUTADA 5

7.1 PRINCIPLES AND POLICIES

An underlying principle in the establishment of Coutada 5 was the rehabilitation of the severely depleted biodiversity, and the re-introduction of those terrestrial species that locally disappeared due to unsustainable utilization. The policy would thus be to firstly improve the status of the indigenous faunal population by means of an effective conservation action, augmented by a structured re-introduction program, and secondly to manage and utilise the terrestrial biodiversity resources in accordance with acceptable international norms and standards. These principles and objectives are implicit in the name of the company: *Africa Futura Wildlife Restoration Lda*

7.2 MANAGEMENT OBJECTIVES

It should be noted that very little baseline data exists on the current status and ecology of the wildlife of Coutada 5. The fact that the first phases of the wildlife re-introduction program will probably only take place by mid- to late 2014 or even later, also means that the success of the program and the effects (ecological and otherwise) thereof will only become apparent at a later stage. The following management objectives for the terrestrial fauna, including domestic animals, of Coutada 5 take cognisance of this fact, and should be regarded as interim measures. These objectives will be elaborated on once the restocking program has at least partially been completed:

- To determine the status of the existing and re-introduced populations of herbivores using appropriate census techniques;
- To continue to develop baseline data on the occurrence of small terrestrial mammals by means of systematic trapping and to gradually develop a complete inventory;
- To establish the success or otherwise of the herbivore reintroduction program;
- To establish the success or otherwise of the lion breeding and release project;
- To identify any species that may need additional or special conservation measures or management attention;
- To monitor the effects of the relocated herbivores on the habitat in general, with specific attention to elephant;
- To prevent any long-term deterioration of the habitat such as accelerated soil loss, bush condensation or encroachment, or an unfavourable shift in herbaceous and woody species composition and structure.
- To control problem animals such as feral dogs.

7.3 PROBLEMS AND THREATS

It is clear from many of the points raised elsewhere in this BBP that the herbivore and predator re-introduction program of Coutada 5 will be fraught with a number of problems, some of which may even threaten the project itself:

- The presence of potentially dangerous game in the fenced-in core wildlife-wilderness zone would make access by the local people to the area altogether undesirable. The underlying principle is that dangerous free-ranging game and (inexperienced and unarmed) people on foot do not mix readily. Access to gather wood, honey and fruit and to fish will have to be prohibited, or stictly controlled and regulated. A facility, for example an overland ferry system, will have to be instituted in order to allow thoroughfare to and from the village of Jovane, to the west of the EN1. This access road will traverse the wildlife-wilderness zone. Otherwise steps may have to be taken to reroute the current road further to the south, in order to bypass the core wildlife-wilderness zone. AFWR may, however, be forced by circumstances to allow, under direct supervision, access of local people to specified areas within the wildlife-wilderness zone for the gathering of ilala palm wine and wild honey.
- There are currently almost no roads traversing the core wildlife-wilderness zone. Vehicular access for management purposes and to allow access to the wildlife blocks will thus have to be provided. This will entail a road trail network of at least 450 km to be constructed.
- As was pointed out above, there is some doubt as to the wildlife carrying capacity for Coutada 5. A very conservative approach will initially have to be followed, until such time as more data becomes available.
- The Operational Plan for the lion breeding- and release project has not been prepared yet. The extent of the program is thus still unknown, and unforeseen management threats may arise.
- The continued poaching problem seems to be more serious than was originally thought. The bush meat trade is certainly alive and well, even though the poachers now have to solely concentrate on mini antelope (the major herbivore having disappeared already). Should this carnage not be stopped, the last remaining small herbivores will also disappear in time. The system of co-management of the biodiversity resources with the local communities, would hopefully lead to the local people regarding poachers as persons stealing from the community. Internal displeasure may do more to combat poaching than law enforcement. However, law enforcement will not be neglected and culprits will be apprehended and charged.
- The Public Consultation and Disclosure Plan (PCDP) will have to be implemented effectively, otherwise the local people will hardly regard the rehabilitation of Coutada 5 as something that will benefit them directly. The reappearance of large game species may then be regarded as a godsend by a few, rather than as an opportunity for many.
- Contingency plans (Operational Plan) will have to be prepared as to how AFWR will deal with large and dangerous game that ‘escaped’ from the fenced area. The local people will have to be appraised of these plans, and should be encouraged to view the ‘escaped’ animals as valuable assets and not as problems.

- Poaching may, if firm steps are not taken right from the beginning, escalate into a serious problem. The system of co-management and ownership residing in the local communities, would hopefully lead to the local people regarding poachers as persons stealing from the community. Internal displeasure may do more to combat poaching than law enforcement. However, law enforcement will not be neglected and culprits will be apprehended.

7.4 MANAGEMENT POLICIES, PRIORITIES, OPTIONS AND ACTIONS

7.4.1 Adaptive management and co-management

Due to the lack of baseline data, the general paucity of information regarding herbivore carrying capacities in the region and also a lack of information as to how an actual re-introduction program on such a macro scale will evolve in reality, the policy of adaptive management will be applied. The presence of the local communities and their status as active roleplayers in the project, will necessitate a policy of co-management with the communities to be followed, through their representative community committees (see discussion elsewhere).

7.4.2 Herbivore re-introductions

7.4.2.1 Purpose

The main purpose of the reintroduction program is to re-establish and maintain viable populations of game animals that previously occurred in the region, but have since disappeared. The following management priorities, options and actions will arise from the reintroduction program and the presence of game herds on Coutada 5:

7.4.2.2 Establish and maintain viable and healthy herbivore populations

Even though a very conservative carrying capacity of 16 ha/LSU will be applied, the number of LSU's that can be carried in the envisaged 210 000 ha wildlife-wilderness zone, is still an impressive total of 13 125 LSU's. Theoretically this means that viable populations of a variety of herbivore species, as was pointed out above in paragraph 2.7, can be maintained.

However, a number of factors outside of the control of AFWR, may negatively influence the success of the re-introduction program, at least with regards to certain scarce or specialised herbivore species:

- Due to the paucity of wildlife elsewhere in Mozambique, AFWR will probably be forced to downscale the planned re-introduction of species that are in short supply, or that may not be available in the country at all. Species such as eland, nyala, reedbuck, waterbuck, bushbuck and Lichtenstein's hartebeest, amongst others, may have to be relocated from neighbouring countries, and even from

there it may be extremely difficult to obtain enough numbers to establish viable populations.

- Within Mozambique there are healthy populations of for example elephant and sable antelope in the far north in Nyassa Game Reserve. The long overland distances that the captured animals will have to travel, with possibly three days and two nights on the road, may rule these populations out as donor populations.
- The re-introduction program will be extremely expensive (provisionally calculated to be approximately US $30 million, fencing and other infrastructure excluded), and AFWR will have to generate donor assistance in order to fund the exercise. Adequate donor funding may not be forthcoming, which will place extreme strain on the in-house resources of AFWR to establish a new protected area of world quality. Should downscaling of the re-introduction program become necessary for certain species, some of the more abundant smaller species may still be relocated in viable populations.
- The planned re-introduction program of free-ranging major predators, will also need to be downscaled in the event that sufficient numbers of herbivore species cannot be sourced and relocated.

The establishment of healthy and viable herbivore populations in Coutada 5 may have an unexpected positive spin-off: the grazing have been totally underutilised for at least two decades, and especially the grass sward will greatly benefit from being utilized. Combustible material will also be reduced by grazing, thus lowering the intensity and negative effects of uncontrolled fires.

The dung of animals such as hippo, elephant and buffalo as well as that of other animals will contribute to soil fertility and enrich the aquatic systems in the core wildlife-wilderness zone, making them more eutrophic. Dung will also be of great benefit to many other organisms throughout the system and in particular dung beetles. The effect on the marshes will also be beneficial as the animals will open up the vegetation, thus permitting better water flow.

Great care would be exercised in sourcing potentially dangerous species such as elephant, buffalo and hippo from areas where they were accustomed to people. With elephant this would be especially important, to the extent that, if at all possible, family herds leaded by a docile matriarch would be selected and captured. The same principle would apply to adult bulls.

Based on superficial observations, it would seem as if the sandy soils may be lacking in certain essential microelements. Supplementary feeding in the form of game blocks would thus be placed at selected sites during winter, with salt licks being made available in summer. No additional feed such as Lucerne or hay will be considered, even during periods of drought. The biomass of herbivorous animals that could be sustained on Coutada 5 would be kept within the natural capacity of the grazing.

7.4.2.3Establish and maintain viable and healthy predator populations

Should the planned herbivore re-introduction progamme come to fruition, AFWR plans to also establish a viable predator population. Lion, leopard, cheetah, hyena and wild dog used to roam the area, and will be re-introduced as soon as it is certain that viable free-ranging populations can be established. As is the case with the herbivores mentioned above, a healthy and viable predator population will be directly dependent on viable and healthy populations of prey species being available.

7.4.2.4 Population control

The primary objectives of this activity are to assist in achieving a dynamic equilibrium between vegetation and animal, and to prevent, or at least minimise, resource-related die-offs.

Specific actions to be taken include the following:

- Identify the species and numbers that may be utilized on a sustainable basis;
- Identify the most cost-effective method of utilization in the case of a culling operation;
- Identify the most economically viable method in the case of a commercial exploitation;
- Identify the best method for dealing with excess meat in a fair and equitable manner;
- Increase removals of selected herbivores during periods of stress such as drought.

7.4.2.5 Trophy hunting

Trophy hunting, or rather hunting *per se*, still lie at the heart of the Coutada system in Mozambique, even though the wildlife numbers during the 1960's when the system was introduced, were much greater than is the case today. Especially trophy hunting will be promoted by AFWR, in order to finance the considerable expenses emanating from the development and management of such a huge protected area. Trophy hunting will be offered as soon as viable populations of trophy species have been established.

7.4.2.6 Removal of excess game by hunting, culling or live capture

The first choice to remove excess game would be hunting. However, given the long distances from the nearest hunter's pool, namely South Africa, it can be predicted that the demand for plains game hunts will not nearly be able to cope with the supply when viable populations have been established. Culling will also not be the method of choice to control herbivore numbers, though culling operations to supply meat to staff and also to the local communities, will in all likelihood become a standard management tool. Live capture operations in Coutada 5 may be hamstrung by the presence of endemic serious wildlife diseases such as foot-and-mouth disease, malignant bovine catarrh and bovine tuberculosis. The prevalence of such diseases will severely restrict the movement of live animals to the markets in neighbouring South Africa, and may limit the sales of live animals to the much less lucrative local market. In such an event the capture and transport

operations may be more expensive than the money realised by the sales, thus necessitating either donor assistance or a fall-back to culling.

7.4.2.7 Game that moved onto community lands

Although the electrified game-proof-fence around the core wildlife-wilderness area will prevent the movement of animals out of the fenced area under normal circumstances, the fence itself should only be regarded as a deterrent and not as an escape-proof barrier. Frightened animals, especially large-bodied species such as buffalo, may barge through the fence and thus end up on communal lands settled by people.

If the breakout involved potentially ***dangerous species*** such as buffalo and especially elephant and lion, actions to be taken will include informing the local inhabitants and the civil authorities of the breakout, trying to chase them back, arrange for a specialized capture operation or putting the animal (s) down if necessary. A fifth option would be to just leave them were they are, since the core wildlife-wilderness zone is surrounded by land managed by AFWR in any case. These animals can thus be offered for commercial hunting.

7.4.2.8 Population monitoring of terrestrial wildlife

The objectives of this activity are firstly to quantify on an annual basis the absolute or relative trends of herbivore species, but especially the species of specific or special interest such as elephant, buffalo and sable, and secondly to quantify other parameters which will help in making objective management decisions. Suitable census techniques will be experimented with, and will probably include both ground and aerial counts.

The size of the fenced wildlife block, and the paucity of roads in the Coutada, especially in the sizeable wilderness zone, will make it difficult to monitor the movements of the relocated animals. To enable management to obtain this important information, a few animals (specifically elephant, buffalo and sable antelope) will be radio-tagged for telemetry purposes.

AFWR will strive to enlist the services of suitable universities, including the Eduardo Mondlane University in Maputo, to run post-graduate programs in Coutada 5. Post graduate students, sponsored by their institutions or by other sources, can provide valuable data on the success or otherwise of the wildlife re-introduction program, and can provide population trends, identify problem areas that should be dealt with and provide insights as to the quality and management of the grazing.

7.4.2.9 Involvement of local communities

It will not be feasible or necessary to involve the local communities in any hands-on manner in the day-to-day management of the terrestrial wildlife resources in the core wildlife-wilderness zone. However, the communities need access to management and information channels with regards to policies and implementation. The Public

Consultation and Disclosure Plan (PCDP, see below) will be harnessed by AFWR to keep the local people informed.

7.4.2.10 Game-proof electrified fence

The ideal situation would have been to do without any game proof fence at all. However, a fence will be needed to contain the re-introduced wildlife to the core wildlife-wilderness zone. Free-ranging populations of wildlife, especially crop-raiding and potentially dangerous big species such as elephant and buffalo, and also major predators such as lion, cannot be accommodated or tolerated in close proximity of human settlement areas. Furthermore, the almost total absence of game on the surrounding community areas, would rule out the re-introduction of expensive and scarce game to an unfenced area.

CHAPTER D8: UTILIZATION OF TERRESTRIAL WILDLIFE IN COUTADA 5

8.1 POLICIES AND PRINCIPLES FOR THE SUSTAINABLE USE OF TERRESTRIAL WILDLIFE

8.1.1 The operational context for the Terrestrial Wildlife Sustainable Utilization Plan

8.1.1.1 Ownership of terrestrial wildlife

Even though the principles of co-management with the communities, and of community based natural resources management (CBNRM) have been accepted as guiding principles by AFWR, the wildlife of Coutada 5, in its broadest sense, have contractually been entrusted to the care of AFWR. The ultimate responsibility thus rests with AFWR. The following Terrestrial Wildlife Sustainable Utilization Plan (TWSUP) has been structured to accommodate and reflect this principle, and to provide a framework for the implementation of the plan. The TWSUP consists of three modules; which are dealt with separately:

- MODULE 1: ESTABLISHING THE CORE WILDLIFE-WILDERNESS AREA
- MODULE 2: TERRESTRIAL WILDLIFE
- MODULE 3: PREDATORS

8.1.1.2 Standardizing on procedures and processes

In order to enhance the marketability and replicability of the management procedures and processes that will be used, the following model for the utilization of the terrestrial wildlife of Coutada 5 has been standardised with other similar plans in the BBP. The various plans can thus be easily interpreted, because the same overriding principles and objectives are applied. Unless it is stated otherwise in the text, the term “wildlife” as used in this section primarily refers to mammals, or more specifically herbivores and predators.

8.1.2 The Political and Administrative Context

Coutada 5 fits into all the applicable policy and legal frameworks of Mozambique and has political blessing at the highest levels. Management should therefore make every effort to link into, and to be part of the larger administrative entities in the region that share the aim of protecting the marine environment and biodiversity. Coutada 5 should be developed as a model that can be emulated elsewhere, and in this regard success will amongst others be determined on how well the Coutada is moulded into other broader political, administrative, conservation and developmental frameworks of the region.

8.1.3 The Developmental Context

The three modules of the plan for the sustainable use of the terrestrial wildlife resources (referred to as the TWSUP) that follows below do not stand on their own. The plans are fully cognisant of, and fit into the larger development plan and BBP for the Coutada.

From the point of view of overall development on the Coutada, the three modules of the TWSUP take particular note of and reflect the following developments and issues:

- Financially speaking, the most attractive form of utilization of the terrestrial wildlife resource will be the consumptive use of the resource by means of trophy hunting. The fully developed and fully stocked and fenced wildlife-wilderness block of 210 000 ha, may conceivably present a hugely popular trophy hunting experience and challenge. The hunting safaris will probably be offered by AFWR and operated by experienced, professional hunters, but may also be outsourced. **This facet will be dealt with and managed in accordance with an OP that will be compiled in due course.**
- Hunters, in common with all other visitors, will pay a daily community conservation fee, as part of the Community Development Plan (CDP, see below)
- Hunting will take place from a hunting camp(s) that will be situated on the outer boundary of the wilderness zone. The number of camps will be determined by the availability of game for hunting purposes, and by the demand for the hunts.

8.1.4 Lessons learned

Some universally applicable principles, also applicable to other plans in this document, will apply to the future utilisation of the Coutada's wildlife resource:

- Timing (The time is not yet ripe to launch the overall terrestrial wildlife strategic utilization program or TWSUP. Offering hunts will be dependent on the establishment of viable populations of animals to be hunted. Planning will be undertaken in the meantime. Hunting of lions, however, may be offered much earlier than hunts on herbivores – see Module 3)
- Scale (the plan is tractable)
- Project size (the itemised plans for the three modules break the TWSUP down in manageable units)

- Communication (local communities need to be informed; appropriate channels as discussed below will be used)
- Participation (Community involvement will of necessity be only peripheral, but will be in line with the policies of co-management and Community-based Natural Resources Management, as a discussed below)
- Decentralisation (only limited decentralisation will be possible, but the local civil authorities will be involved from a technical and permit point of view)
- The human resource (also try to involve women and youth in the venture)
- Cost and benefit (real benefits channeled to the community will lead to behavioral change)
- Partnerships (the advisability/possibility to channel hunting-derived funds to the local community will be investigated)
- Private sector involvement (hunting-based private sector initiatives by entrepreneurs inside the community will be investigated)
- Monitoring and evaluation (the community will be involved in monitoring the wildlife situation outside of the fenced core wildlife block)
- Research and data collection (this will be dealt with in-house by AFWR)
- Sustainability (the program will need to be sustainable and will build human capacity wherever possible)
- Ownership (fully vested in AFWR; however, the concept of co-management will be applied)

8.1.5 From lessons to principles

The principles that were considered and accommodated in the formulation of the TWSUP are generally similar to those used for the other biodiversity plans contained in this document, and may be summarised as follows:

- The plans for the three modules will be as simple as possible in terms of structure and execution, and will not necessitate extensive behavioural changes over a short period of time.
- Implementation and accountability will of necessity be vested in AFWR
- The plans for the three modules will only succeed if the local communities perceive and experience the benefits to be real and sustainable, otherwise unsustainable poaching may continue and even worsen in scale
- The TWSUP, once the BBP is approved, will be workshopped with the local people to ensure that they understand the long-term benefits to all the roleplayers, including themselves
- Without the formal community structures as outlined in the TWSUP below and elsewhere in the BBP being put in place, the implementation of the plan will be jeopardised.

8.2 MANAGEMENT OBJECTIVES, PRIORITIES AND ACTIONS FOR THE TERRESTRIAL WILDLIFE SUSTAINABLE UTILIZATION PLAN: MODULE 1: ESTABLISHING THE CORE WILDLIFE-WILDERNESS AREA

8.2.1 An eleven-point procedure for implementing Module 1: Establishing the core wildlife-wilderness area of the Terrestrial Wildlife Sustainable Utilization Plan.

A simple 11-step process, based on the same principles as applied elsewhere in the BBP, has been developed for Module 1 of the TWSUP for Coutada 5. The steps are interlinked in a chain that brings accumulative strength with every subsequent step added. Leaving one out, or not doing it thoroughly may cause the entire chain to fall short of the mark, and may cause the entire management process for terrestrial wildlife to fail entirely. It is important to note that some of the steps are overlapping, and that some of them can be implemented concurrently rather than in a linear fashion. Most of them also require a lead period of awareness building.

The eleven steps are:

Step 1:	Identify and demarcate the area to be zoned as the core wildlife-wilderness zone
Step 2:	Identify the family households presently living in the core wildlife zone, and who will have to be resettled in phases (Refer to the Resettlement Action Plan)
Step 3:	Establish a Coutada Community Conservation Committee (refer to the appropriate sections of the BBP)
Step 4:	Demarcate the 22 individual game blocks as was approved in the contract with the Government of Mozambique (GoM), and identify each block on the ground.
Step 5:	Establish contact with possible donor agencies, to assist with the fencing of the core wildlife zone, and with the re-introduction of wildlife
Step 6:	Identify the first block to be game-proof fenced, and start with the fencing thereof
Step 7:	Continue to fence the outer perimeter of the core wildlife-wilderness zone
Step 8:	Plan and provide a road network
Step 9:	Plan and provide a water reticulation network for the wildlife-wilderness zone
Step 10:	Obtain DUATS for the 22 blocks
Step 11:	Market the 22 game blocks to interested investors

8.2.2 Application of the 11- point plan.

For each step the purpose is briefly noted, the rationale is given, and discrete actions to be taken are listed. Finally, where applicable, an assessment of potential problems and dangers (threats) is given.

STEP 1: IDENTIFY AND DEMARCATE THE AREA TO BE ZONED AS THE CORE WILDLIFE-WILDERNESS ZONE

(1) Purpose

The purpose of step 1 is to identify and demarcate the area to be zoned as the core wildlife-wilderness zone

(2) Rationale

Given the mission and objectives of the project, as outlined above, AFWR took the bold decision to develop and rehabilitate as large an area as possible, whilst realizing the tremendous costs of the operation as well as the multitude of obstacles that will be faced along the way. A cheap and easy way out would have been to merely pay lip service to the requirements of the GoM to have the area rehabilitated and developed, whilst having no intention to do so (as was the case with the previous concessionaire). Should the objectives of AFWR as outlined above indeed come to fruition, the end result will be a new protected area of more than 200 000 ha, restored to its erstwhile glory. To try and rehabilitate the wildlife of the entire area outside of the major towns and settled areas (more than 600 000 ha) would have been impossible even to contemplate.

(3) Actions to be taken

Preliminary surveys (both aerial and from the ground) indicated that the best area to be developed for wildlife rehabilitation purposes, from an ecological and habitat perspective, is situated to the west of the EN1 main road. Surveys then indicated that much more households than the original estimates, have settled in especially the northern and western reaches of this priority block. The size of the block to be rehabilitated is thus influenced by two overriding considerations: firstly to resettle as few as possible people, and secondly to establish as big as possible an area.

(4) Threats

Two major threats have been identified:

- The people that will have to be involuntarily resettled will be subject to social stress, and may not take kindly to being resettled. AFWR will try to alleviate this possible threat by offering resettlement advantages, which will more than compensate for the loss of their assets (refer to the Resettlement Action Plan below). Also, should donor assistance not be forthcoming, the huge expenses inherent in the resettlement action, may not be affordable by AFWR.
- The wildlife rehabilitation exercise, inclusive of fencing and the re-introduction of large numbers of game, will be more expensive than a single profit-oriented private company can afford. To reach profitability will nevertheless be a major objective, but with the huge initial costs taken into consideration, it is extremely doubtful that in-house profitability

would ever be a realistic expectation without external financial assistance being obtained. Donor assistance to help fund the rehabilitation program, and to ensure that the project becomes viable, will thus become imperative.

STEP 2: IDENTIFY THE FAMILY HOUSEHOLDS PRESENTLY LIVING IN THE CORE WILDLIFE ZONE, AND WHO WILL HAVE TO BE RESETTLED IN PHASES (REFER TO THE RESETTLEMENT ACTION PLAN)

(1) Purpose

The purpose of step 2 is to identify the households who are presently living in the core wildlife zone, and who will have to re resettled.

(2) Rationale

Dangerous big game will be re-introduced into the fenced area. The 22 game blocks will be sold to investors at prices firstly concomitant with the huge initial capital outlay that will be needed to establish the core wildlife zone, and secondly to ensure a sense of wilderness and exclusivity. Access to the core wildlife area by humans will thus have to be restricted, and obviously no people, other than staff, could be allowed to remain living in the core wildlife zone. How the resettlement action is going to be dealt with, is described below in the Resettlement Action Plan.

(3) Actions to be taken

Refer to the Resettlement Action Plan (RAP) below for a discussion.

(4) Threats

All the treats inherent in any involuntary resettlement action will have to be considered and alleviated (Refer to the RAP below).

STEP 3: ESTABLISH A COUTADA COMMUNITY CONSERVATION COMMITTEE (REFER TO THE APPROPRIATE SECTIONS OF THE BBP)

(1) Purpose and rationale

The purpose and rationale for this step is discussed in the appropriate community and social action plans, as discussed below. It will thus not be repeated here.

STEP 4: DEMARCATE THE 22 INDIVIDUAL GAME BLOCKS AS WAS APPROVED IN THE CONTRACT WITH THE GOVERNMENT OF MOZAMBIQUE (GOM), AND IDENTIFY EACH BLOCK ON THE GROUND.

(1) Purpose

The purpose of this step is to individually demarcate each of the 22 game blocks that were approved by the GoM

(2) Rationale

The zoning map illustrates the location of the 22 blocks to the west of the EN1 main road. These blocks of 5 000 ha each have been localized in such a manner that they form the buffer zone around the wilderness zone. The initial plan, which may have to be adapted or changed as information from the social impact assessments become available, provides for 210 000 ha to be game-proof fenced, of which 110 000 ha will be the 22 game blocks, enclosing a 100 000 ha wilderness zone. This fenced area of 210 000 ha will probably be the largest fenced protected area in private ownership in the world. Notwithstanding its huge size, the core wildlife-wilderness block will constitute only 31% of the total surface area of Coutada 5.

(3) Actions to be taken

Initially AFWR will identify the 22 blocks on the ground with the aid of GPS plotting. To do this will entail the construction of a rough vehicular track around the total length of the core wildlife area (some 185 km). Each block will be identified with corner beacons and with a numbered sign at the boundary, and the coordinates will be noted. The road/track will also serve as the cut-line along which the game-proof fence (see below) will be erected. Discussions with the GoM will indicate whether ‘official’ surveying of the 22 blocks will be mandatory. Should that be the case, such surveying will be undertaken as soon as feasible.

(4) Threats

Once the project has developed to this stage, no real threats to the demarcation of the 22 blocks and the enclosed wilderness zone are foreseen (barring unaffordable expenses and the possible non-availability of wildlife to be re-introduced; refer to Step 5 below)

STEP 5: ESTABLISH CONTACT WITH POSSIBLE DONOR AGENCIES, TO ASSIST WITH THE FENCING OF THE CORE WILDLIFE ZONE AND WITH THE RE-INTRODUCTION OF WILDLIFE.

(1) Purpose

The purpose of this step is to provide for negotiations with possible donor agencies to assist with the fencing of the core wildlife zone, and secondly with the re-introduction of wildlife.

(2) Rationale

As was pointed out above, AFWR will have no option but to game-proof fence a core wildlife-wilderness zone. The total length of the fence, namely approximately 185 km, will have to be electrified. The total cost of the fence has conservatively been calculated at US $1,46 million. Since this fence will be required in order to have any hope of establishing a viable protected area stocked with free ranging African game, it is hoped that donor funding will indeed be forthcoming.

AFWR realizes that donor agencies may be reluctant, or even unwilling, to donate funds for the rehabilitation of a conservation area 'owned' and operated by a private company. It is nonetheless hoped that prospective donor agencies can be convinced that the main objective is the rehabilitation of an erstwhile wildlife paradise, and that the establishment of a new protected area rising from the ashes of something valuable that has been virtually destroyed, is first and foremost a conservation action.

Negotiations with possible donor agencies will not be restricted to assistance with the fencing, but also with the much more expensive and uncertain wildlife re-introduction program (Refer to Module 2 below). Such assistance will not be restricted to 'financial' donors, but also to donors such as the GoM who may hopefully 'donate' game from other sources in Mozambique.

(3) Actions to be taken

AFWR will research all possible avenues of funding.

(4) Threats

Should financial assistance not be forthcoming, and given the tremendously expensive wildlife re-introduction program that will follow, AFWR will be forced to downscale the project to such an extent that the end result may not be a viable proposition any more, whether financial, socio economical or ecological. In such an event, very little or no benefits will accrue to the local communities.

STEP 6: IDENTIFY THE FIRST BLOCK TO BE GAME-PROOF FENCED, AND START WITH THE FENCING THEREOF

(1) Purpose

The purpose of this step is to identify the first block to be game-proof fenced, and to start with the fencing thereof.

(2) Rationale

The ideal would have been to establish a 'new' protected area in the Coutada, without any internal fences and linking up with adjoining protected areas (such as Coutada 5 and Zinave National Park) to create a large unit stocked with wildlife. This is unfortunately not possible: both Zinave National Park and Coutada 5 have been denuded of wildlife and settled by people to the same extent as Coutada 5. The ideal situation of merely re-establishing what was lost, namely a huge unfenced area stocked with free-ranging wildlife, is thus impossible. Any game species re-introduced to an unfenced area will be lost: poaching will take its toll, and the animals will move out to adjoining areas denuded of wildlife where there is no wildlife conservation ethic in place. A hugely expensive exercise with irreplaceable wildlife will thus come to naught.

The first block where the fencing operation will start, will probably be in the vicinity of the already-established AFWR Headquarters next to the EN1 main highway, between the Muar and Ripembe Rivers. It has been decided that the outside perimeter of the core wildlife-wilderness block of (hopefully) 210 000 ha will be fenced. At completion of the fence with an estimated length of approximately 185 km, the core area of 210 000 ha will thus be fenced.

However, there is a need to first fence a holding camp (or release camp) of say 3 000 ha near the AFWR headquarters mentioned above. The first game to be restocked can thus be released into this temporarily fenced unit, until such time as the outer perimeter has been fenced. It is highly likely that more than one such temporary holding camp will be needed: should all the game be released at one site, it will take a long time for them to naturally resettle the total area, with the western boundary being some 60 km away from the release site. The placing of these additional holding camps will be determined by practical realities such as progress with the outer fence, and the ability to reach the holding camps with big trucks loaded with game.

(3) Actions to be taken

The fence will be a 'standard' game proof fence of 2,4 meters high, with three high voltage-low wattage electrified strands on the inside.

(4) Threats

No threats in fencing the first holding camp are foreseen. AFWR will carry the expenses.

STEP 7: CONTINUE TO FENCE THE OUTER PERIMETER OF THE CORE WILDLIFE-WILDERNESS ZONE

(1) *Purpose*

The purpose of this step is to continue with the fencing of the outer perimeter of the core wildlife-wilderness zone.

(2) *Rationale*

AFWR would, as was pointed out above, have no option but to fence the total core area.

(3) *Actions to be taken*

A standard fencing operation will be required, albeit on a massive scale.

(4) *Threats*

The logistics of fencing such a huge area in a remote and undeveloped region of Mozambique, are almost daunting. AFWR accepted the fact that the fencing project will be costly, time consuming and probably confronted with unforeseen obstacles. Whilst the fencing of the total area is underway, negotiations will start with possible donor agencies. It is hoped that some financial assistance to fund the huge undertaking will be forthcoming.

STEP 8: PLAN AND PROVIDE A ROAD NETWORK

(1) Aim

The aim of this step is to provide a basic road network, to enable all the 22 wildlife blocks and the enclosed wilderness area to be reached

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(2) Rationale

Since the 22 wildlife blocks will be ‘sold’ to investors, and bearing in mind that the current road network is almost non-existent, is stands to reason that vehicular access to firstly the outer perimeter of the core area, to enable fencing to be undertaken, and to the 22 blocks will have to be provided.

(3) Actions to be taken

Except for the outer boundary that will have to be cleared to allow fencing to continue, and to act as a firebreak and patrol road, it is not envisaged that substantial clearing of vegetation to provide for roads will be needed.

(4) Threats

To establish an internal road network will be time consuming (as much as 450 km of access roads may have to be provided), but not overly expensive. Finances are thus not a threat. However, should it prove to be impossible to attract enough donor assistance with especially the wildlife re-introduction program, and should the re-introduction program itself be hamstrung by a lack of animals to be relocated, progress with the planned road network may be halted.

STEP 9: PLAN AND PROVIDE A WATER RETICULATION NETWORK FOR THE WILDLIFE-WILDERNESS ZONE

(1) Aim

The aim of this step is to ensure that a suitable water reticulation network is established.

(2) Rationale and actions to be taken

The perennial Rio Save will unfortunately not serve as a direct source of water for the re-introduced wildlife; the river itself will be outside of the core wildlife-wilderness area, and the fenced-in animals will in any case not be able to reach the river. Inside the core wildlife-wilderness block there are three rivers: from south to north they are the Muar, the Bunga, and the Ripembe. These rivers are not perennial, and it seems as if the pools in the rivers dry up during the winter, or at least that they are dry during spells of drought.

These rivers and pools can thus not be regarded as reliable sources of permanent water for game, and will have to be augmented by artificial watering points. The need for and placing of such artificial watering points, will only be determined after an aerial survey of pools in the abovementioned rivers has been undertaken.

Factors to be taken into consideration include the following:

- Sinking of boreholes in such a remote and inaccessible region is expensive, and neither the quantity nor the quality of the water can be guaranteed.

- Water may be pumped from the Rio Save to one or more distribution points; the flat terrain will necessitate the erection of concrete tanks from where gravity feed will be possible.
- At least 120 km of underground pipes may be needed, indicating an expensive operation.
- The ideal should be to have permanent watering points not more than eight kilometers apart; even then water dependent species such as impala will not be able to settle the full area (they seldom establish home ranges further than two kilometer from water)
- There would be no sense in establishing an expensive water reticulation network, if the full planned operation, as elucidated above, can not continue due to either a lack of funds or a lack of donor animals for the re-introduction program.
- Given the above uncertainties, a comprehensive Operational Plan dealing with all eventualities, will be compiled in due course.

Planning: Prepare an OP dealing with water reticulation

(3) Threats

Two possible but nevertheless real threats have already been listed above: firstly a lack of donor animals for the relocation program, and secondly a lack of donor funds to fund the extremely expensive wildlife re-introduction operation (see Module 2 below).

STEP 10: OBTAIN DUATS FOR THE 22 BLOCKS

(1) Aim

The aim of this step is to ensure that government approval is obtained, by means of so-called DUATS issued by the GoM, to 'sell' the 22 wildlife blocks to investors

(2) Rationale and actions to be taken

No investor will invest in land of which the 'ownership' will be vested in somebody else's name. AFWR holds the contract with the GoM and will thus act as a holding or development company, but although approval to demarcate and 'sell' 22 wildlife blocks of 5 000 ha each has been granted, 'ownership' of these blocks must still be transferred to separate companies. AFWR will thus establish 22 separate companies, which will then be 'sold' legally to investors.

(3) Threats

Although AFWR is convinced that there will be a demand for the 22 blocks, this cannot be guaranteed.

STEP 11: MARKET THE 22 GAME BLOCKS TO INTERESTED INVESTORS

(1) Aim

The aim of this step is the successful marketing of the 22 wildlife blocks to interested investors.

(2) Rationale and actions to be taken

The core of the whole rehabilitation program is vested in the sale of the 22 wildlife blocks. Revenues earned by the sales will enable AFWR to recover a major portion of the setting up costs inherent in the rehabilitation of Coutada 5. It is accepted, however, that donor funding will have to be solicited to cover the shortfall.

With regards to selling the 22 blocks, AFWR accepts the following:

- That the sale of the blocks will start once prospective investors can be convinced of the *bona fides* of AFWR, which in turn will be directly dependent on progress with fencing, the acquisition of game and the actual re-introduction of game.
- That the sale of the blocks will rely heavily on the quality and exclusivity of the product that is on offer. The core wildlife-wilderness zone encompassing the 22 blocks, will be the largest such a unit in private ownership in the world. This fact alone should be hugely attractive to prospective investors.
- That the core wildlife-wilderness zone will have to be adequately stocked with a variety of game species to reflect the true African wilderness, inclusive of big game species and the major predators.
- That the prices for the blocks must take the uniqueness of the product on offer into consideration, whilst still being low enough to attract investors to such a remote region.
- That the whole development must be transparent and of high integrity.
- That prospective investors must be assured of the integrity, professionalism, management ability and goodwill of AFWR
- That prospective investors must be assured of the security of their investments, in a country where the land belongs to the state.

(4) Threats

Although AFWR is convinced that there will be a demand for the 22 blocks, this cannot be guaranteed. A low demand will at least partially jeopardize the venture.

8.3 MANAGEMENT OBJECTIVES, PRIORITIES AND ACTIONS FOR THE TERRESTRIAL WILDLIFE SUSTAINABLE UTILIZATION PLAN: MODULE 2: TERRESTRIAL WILDLIFE

8.3.1 An eleven-point procedure for implementing Module 2 of the Terrestrial Wildlife Sustainable Utilization Plan: Terrestrial Wildlife.

A simple 11-step process, based on the same principles as applied elsewhere in the BBP, has been developed for Module 2 of the TWSUP for Coutada 5. It is important to note that some of the steps are overlapping, and that some of them can be implemented concurrently rather than in a linear fashion. Some of the steps will also run concurrently with the other Modules of the TWSUP.

The eleven steps are:

Step 1: Take cognizance of the results of Module 1
Step 2: Decide on species and numbers to be relocated and obtain Government approval
Step 3: Liaise with possible sources of wildlife that can be re-introduced
Step 4: Liaise with possible donor agencies to assist with the funding of the re-introduction program
Step 5: Re-introduce suitable species to the holding camps
Step 6: Release the founder populations from the holding camps into the large unit once the perimeter fence has been completed
Step 7: Determine annual quotas of species that can be sustainably harvested
Step 8: Market the annual quotas to investors and for trophy hunting purposes
Step 9: Manage and monitor the off-take of the annual quota
Step 10: Make benefits, as prescribed in the social action plans (see below), available to the local communities
Step 11: Arrange with suitable tertiary education institutions for post graduate studies to be undertaken in Coutada 5

8.3.2 Application of the 11- point plan.

For each step the purpose is briefly noted, the rationale is given, and discrete actions to be taken are listed. Finally, where applicable, an assessment of potential problems and dangers (threats) is given.

STEP 1: TAKE COGNISANCE OF THE RESULTS OF MODULE 1

(1) Aim

The aim of Step 1 is to ensure that the lessons learned from, and progress made during Module 1 are applied to Module 2

(2) Rationale and actions to be taken

The implementation of Module 1 led to the framework for a full wildlife re-introduction program being established. Step 1 thus follows logically on the successful execution of Module 2.

(3) Threats

Without successfully completing Module 1, the implementation of Module 2 will be impossible. This step is thus also subject to the same threats facing Module 1.

STEP 2: DECIDE ON SPECIES AND NUMBERS TO BE RELOCATED AND OBTAIN GOVERNMENT APPROVAL

(1) Aim

AFWR decided to stick to acceptable ecological principles in selecting suitable species for re-introduction.

(2) Rationale and actions to be taken

As was pointed out elsewhere, it was decided that the wildlife re-introduction program will be limited firstly to those species that used to occur in the region in historical times, secondly to species for which the habitat is deemed to be suitable, and thirdly species for which founder populations can be found. It was also decided not to include species such as Black rhino that may present insurmountable policing problems to combat poaching (Black rhino are in any case also prohibitively expensive, and the chances of obtaining them in viable numbers are almost nil).

A list of species to be re-introduced, based on the calculated carrying capacity indicated as LSU's, has been discussed above. It should be viewed as a desk exercise, and not as an actual plan of action that will be pursued. An abridged version of the table is included again:

Specie	Numbers at full capacity	Initial numbers to be introduced
Roan antelope	378	108
Sable	1 006	195
Hippo	365	245
Buffalo	3 020	858
Zebra	1 510	429
Blue Wildebeest	2 423	404
Waterbuck	1 293	368
Reedbuck	328	93

Lich Hartebeest	218	36
Bushbuck	306	48
Duikers	864	168
Giraffe	253	53
Kudu	1 479	189
Nyala	1 768	295
Suni	1 174	390
Eland	838	130
Elephant	246	123
Impala	7 109	954
Steenbuck	1 476	228

No research with regards to the availability of the above species has been undertaken as yet. The list should thus be regarded as a 'want' list based on an ideal situation, which is not going to be the case. The to-be-released numbers indicated above can be regarded as virtually impossible to achieve. It would for example not be realistic to expect a total of 108 Roan antelope and 390 suni to be captured elsewhere and translocated to Coutada 5. However, AFWR will do its utmost to release viable populations of all of the species mentioned above.

It should also be realized that veterinary restrictions may impede the translocation of wildlife over international borders, and that the highly developed game industry of South Africa may be ruled out as a source of live game for Coutada 5.

Even though a 'total' re-introduction program will thus be impossible to implement, the natural increases of herbivore populations relocated to a large area with suitable habitat and limited numbers of predators, will to a large extent make up for the initial lower than ideal numbers that were released. It is also highly likely that AFWR will end up re-introducing greater numbers of the more common species than those indicated above. AFWR accepts that the principle of *adaptive management*, as described elsewhere, will have to be followed.

Finally, government approval would be needed with regards to the whole wildlife re-introduction program.

(3) Threats

The same threats facing the implementation of Module 1 above, will also apply here. It is also possible, but not likely, that the GoM may not approve of the full re-introduction program.

STEP 3: LIAISE WITH POSSIBLE SOURCES OF WILDLIFE THAT CAN BE RE-INTRODUCED

(1) Aim

The aim of step 3 is to identify, and liaise with, possible sources of donor wildlife populations

(2) Rationale and actions to be taken

One of the major obstacles facing AFWR in pursuit of the rehabilitation of Coutada 5 and the restoration of its wildlife, will be an expected paucity of wildlife for re-introduction purposes. The wildlife of Mozambique has been denuded to such an extent that very few places with viable populations still exist. One such place is Niassa Reserve in northern Niassa and Cabo Delgado provinces, with healthy populations of for example elephant, buffalo and Sable antelope. Even though the logistics of capturing game there and then transporting them more than 1 500 km to the Coutada over poor roads are daunting, AFWR will nevertheless investigate the possibility. Contact will also be established with government authorities, conservation agencies and private game ranchers in neighbouring countries, from where some wildlife may possibly be sourced.

(3) Threats

The extreme scarcity of game in Mozambique is a definite impediment, and is unfortunately outside of AFWR's control. Huge logistical problems, as well as veterinary restrictions regulating the translocation of live game, will also have to be addressed and overcome if possible.

STEP 4: LIAISE WITH POSSIBLE DONOR AGENCIES TO ASSIST WITH THE FUNDING OF THE RE-INTRODUCTION PROGRAM

(1) Aim

The aim of Step 4 is to ascertain whether donor funding may be forthcoming to assist with the tremendously expensive wildlife re-introduction program.

(2) Rationale and actions to be taken

Whilst it is realized that donor agencies may be understandably hesitant to donate funds to a private sector initiative to acquire and relocate wildlife to an area under private sector control, AFWR is of the opinion that the main objectives of the venture, namely the rehabilitation of a protected area, the restoration of the wildlife that occurred there in recent historical times, and also to directly influence the lives of the local communities for the better, may indeed result in a marketable product.

Should donor funding make it possible to re-introduce viable populations of those wildlife species that were extirpated in recent times, the end result will be a conservation success story. In a country such as Mozambique, where the previously

abundant wildlife were decimated to the point of extinction on most areas in a matter of 15 years, such a success will be tantamount to hope being reborn.

The people of Coutada 5 are generally speaking extremely poor, with very limited opportunities to better their lives. The district of Machanga as well as the portions of the districts of Chibabava and Machaze included in Coutada 5, are poorly developed. There are almost no roads network and access to schools and health services are severely restricted. Full-time employment opportunities are extremely limited. That Coutada 5, at full development, will dramatically change this unfortunate situation for the better is a foregone conclusion. Funding of the wildlife re-introduction program will thus have a direct positive effect on the livelihoods of the local people.

(3) Threats

AFWR will be dependent on donor funding in order to achieve the objectives of the project, as outlined above. Without donor funding, the planned wildlife-re-introduction program will need to be drastically downscaled.

STEP 5: RE-INTRODUCE SUITABLE SPECIES TO THE HOLDING CAMPS

(1) Aim

The aim of Step 5 is to re-introduce suitable species of herbivores to the temporary holding camps.

(2) Rationale and actions to be taken

The large size of the planned fenced core wildlife-wilderness zone (210 000 ha), will rule out, initially at least, any releases of herbivores straight into the large unit. The full unit will take some time to be fenced, and it would be a waste of time to wait until the outer perimeter fence has been completed. It is thus imperative that early releases should be done into smaller fenced holding camps. Given the large size of the main unit, AFWR will in all likelihood end up establishing a number of such holding camps. The siting of these camps will be determined by progress with the outer fence, and by accessibility to large trucks carrying live game.

STEP 6: RELEASE THE FOUNDER POPULATIONS FROM THE HOLDING CAMPS INTO THE LARGE UNIT ONCE THE PERIMETER FENCE HAS BEEN COMPLETED

(1) Aim

The aim of Step 6 is to release founder populations of herbivores into the main unit.

(2) Rationale and actions to be taken

All the holding camps will only act as temporary holding facilities for the re-introduced herbivores. Management will decide on when to release the animals into the large unit. Even though the holding camps will be of a temporary nature, it is likely that some or all of them will remain in place for as long as herbivores are still introduced, even though the perimeter may have been completed by then

(3) Threats

Anti-poaching measures in the small holding camps will probably be quite easy and successful, but once the animals are released into the large unit the threat of poaching may be real. The Field Ranger unit will be tasked to concentrate on this threat. By that time, however, it is hoped that the various community structures will have been established and in operation, thus hopefully ensuring the goodwill of the community at large, thus branding poaching as an unacceptable practice detrimental to the best interests of the people themselves..

STEP 7: DETERMINE ANNUAL QUOTAS OF SPECIES THAT CAN BE SUSTAINABLY HARVESTED

(1) Aim

The aim of Step 7 is to acknowledge the need for proper planning to determine annual off-takes of herbivores (and carnivores; see Module 3 below).

(2) Rationale and actions to be taken

It is likely that, together with agricultural ventures, harvesting of surplus herbivores and carnivores on a sustainable basis, will form the backbone of AFWR's commercial utilization of the natural resources of Coutada 5. The harvest will be determined by active and ongoing monitoring of the situation, with regards to both herbivores and the quality of the available grazing. The form of this annual harvest will be determined by the actual situation at that moment in time, but it is hoped that trophy hunting, being the most lucrative form of utilization, will form the backbone of the harvesting program. Live capture operations will be actively pursued, but faced with a multitude of logistical problems and especially veterinary restrictions, may never reach the ideal of preferably selling live game rather than relying on the income from hunting. Eco-tourism ventures will also be pursued, but will probably never, given the isolation of Coutada 5 from prospective eco-tourist markets, become the method of utilization of choice.

(3) Threats

The successful marketing of Coutada 5 as a prime trophy hunting destination, will be totally dependent on the successful establishment of a prime African wilderness stocked with big game species. Should AFWR fail to reach this objective, the whole

project, inclusive of the community-based projects, will either fail outright, or will have to be scaled down.

STEP 8: MARKET THE ANNUAL QUOTAS TO INVESTORS AND FOR TROPHY HUNTING PURPOSES

(1) Aim

The aim of Step 8 is to ensure that the available quotas of herbivores (and carnivores) are successfully marketed.

(2) Rationale and actions to be taken

Since the profitable sustainable use of the renewable natural resources of Coutada 5 will provide the foundation to ensure the continued long-term existence of the protected area, AFWR will have to ensure that the product is marketed effectively. It is envisaged that a prime African wildlife-wilderness block of 210 000 ha that is available for hunting, will in itself be a huge drawcard for outfitters as well as trophy hunters. AFWR will have to ensure that this product is marketed effectively, either by undertaking the marketing program in-house, or by outsourcing it to contracted outfitters. Decisions in this regard still need to be taken.

It is also highly likely that at least some, if not the majority, of the investors investing in the 22 wildlife blocks, will either be avid amateur hunters, or may be involved in the trophy hunting industry in a professional capacity. At least a certain portion of the annual quota will be made available to local shareholders, at reduced rates. Should AFWR, or a subsidiary of AFWR, become directly involved in offering and conducting hunts, the fees for such hunts will have to be determined by consultation with all stakeholders. Irrespective as to how the hunt is offered and conducted, a to-be-determined percentage of the trophy fees will accrue to the local communities, and the fund will be administered by the Community Trust. (see below)

(3) Threats

The threats mentioned above in Step 7, are also applicable to this step.

STEP 9: MANAGE AND MONITOR THE OFF-TAKE OF THE ANNUAL QUOTA

(1) Aim

The aim of Step 9 is to ensure that the harvesting of the annual quotas takes place in accordance with the planned harvest.

(2) Rationale and actions to be taken

It is foreseen that large numbers of animals will, at full stocking capacity, have to be harvested annually. Such an exercise will have to be managed and monitored effectively by AFWR. Such management will include ensuring that the required licenses are in place, enforcing rules, ensuring accountability with regards to the numbers of animals removed, distributing meat and financial benefits to the Community Trust, and effectively dealing with the treatment and shipment of trophies. Re-allocation of animals to other forms of consumptive use may be necessary.

STEP 10: MAKE BENEFITS, AS PRESCRIBED IN THE SOCIAL ACTION PLANS (SEE BELOW), AVAILABLE TO THE LOCAL COMMUNITIES

(1) Aim

The aim of Step 10 is to ensure that all the consumptive-use-based benefits as described in the social action plans (see below), are indeed made available to them.

(2) Rationale and actions to be taken

Two primary objectives of the Coutada 5 project are to ensure that the local communities are actively involved, and that they derive benefits from all commercial activities taking place in Coutada 5 (see discussions above and below). These activities include agricultural activities (dealt with elsewhere) as well as consumptive uses of the wildlife resources. The basic principle that is applied by AFWR in this regard is quite simple: if the goodwill of the people is needed to ensure the success of the venture, which is definitely the case, they will have to be actively involved as far as is feasible, and they must benefit from the sustainable use by AFWR of the renewable resources in the Coutada. The objective will be to ensure that they relate positively to all the developments and activities of Coutada 5, preferably to the extent that they in time will come to regard the Coutada as a friendly and benevolent institution.

(3) Threats

Should the communities not relate to the Coutada as a benevolent institution providing real and tangible benefits to them, the chances of AFWR's objectives ever be realized are slim indeed.

STEP 11: ARRANGE WITH SUITABLE TERTIARY EDUCATION INSTITUTIONS FOR POST GRADUATE STUDIES TO BE UNDERTAKEN IN COUTADA 5

(1) Aim

The aim of this step is to liaise with suitable tertiary education institutions for post graduate studies to be undertaken in Coutada 5

(2) Rationale and actions to be taken

The total rehabilitation of a protected area such as Coutada 5, will open the doors for a large number of applied research projects that can be undertaken. These projects can cover a wide range of disciplines, including biodiversity and social projects, and will provide information that would be hugely beneficial to the management of Coutada 5. AFWR will not have funds to finance such projects, but efforts will be made, in direct collaboration with the tertiary institutions, to obtain the necessary sponsorships.

8.4 MANAGEMENT OBJECTIVES, PRIORITIES AND ACTIONS FOR THE TERRESTRIAL WILDLIFE SUSTAINABLE UTILIZATION PLAN: MODULE 3: PREDATORS

8.4.1 A nine-point procedure for implementing Module 3 of the Terrestrial Wildlife Sustainable Utilization Plan: Predators

A simple 9-step process, based on the same principles as applied elsewhere in the BBP, has been developed for Module 3 of the TWSUP for Coutada 5. It is important to note that some of the steps are overlapping, and that some of them can be implemented concurrently rather than in a linear fashion. Some of the steps will also run concurrently with the other Modules of the TWSUP.

The 9 steps are:

Step 1: Take cognizance of the results of Modules 1 and 2
Step 2: Decide on predator species and numbers to be re-introduced
Step 3: Liaise with possible sources of predators
Step 4: Plan and erect suitable holding/breeding camps
Step 5: Re-introduce the selected species of predators to holding/breeding camps
Step 6: Maintain the wildness of the re-introduced species
Step 7: Market/make available surplus animals for hunting or live relocation
Step 8: Release founder populations of selected predator species into the core wildlife-wilderness zone
Step 9: Make benefits, as prescribed in the social action plans (see below), available to the local communities

8.4.2 Application of the 9-point plan.

For each step the purpose is briefly noted, the rationale is given, and discrete actions to be taken are listed. Finally, where applicable, an assessment of potential problems and dangers (threats) is given.

STEP 1: TAKE COGNIZANCE OF THE RESULTS OF MODULE 1

(1) Aim

The aim of Step 1 is to ensure that the lessons learned from, and progress made during Module 1 are applied to Module 3

(2) Rationale and actions to be taken

The implementation of Module 1 led to the framework for a full wildlife re-introduction program being established. Step 1 for the predator re-introduction program thus follows logically on the successful execution of Module 1. Facets of the plan for Module 2 are also applicable and will be heeded

(3) Threats

Without successfully completing Module 1, the implementation of Modules 2 and 3 will be impossible. This step is thus also subject to the same threats facing Module 1.

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STEP 2: DECIDE ON PREDATOR SPECIES AND NUMBERS TO BE RE-INTRODUCED

(1) Aim

AFWR decided to stick to acceptable ecological principles in selecting suitable species for re-introduction.

(2) Rationale and actions to be taken

As was pointed out elsewhere, it was decided that the wildlife re-introduction program for herbivores will be limited firstly to those species that used to occur in the region in historical times, secondly to species for which the habitat is deemed to be suitable, and thirdly species for which founder populations can be found. These prerequisites also apply *situ situ* to the re-introduction of predators.

The decision was thus made that the full spectrum of major predator species that used to roam the area in recent historical times, should be re-introduced. The species classified as ‘major’ predators include lion, leopard, spotted hyena, cheetah and African wild dog.

Since no predator introductions can be done to the core wildlife-wilderness block until such time as viable populations of prey species have been established, AFWR decided to initially only concentrate on lions, and to release the first animals into suitable lion-proof enclosures. Lions can be relatively easily kept in captivity, whereas the other species would firstly be difficult to source, and secondly would entail a much more complicated initiation period in the holding camps.

(3) Threats

The same threats facing the implementation of Modules 1 and 2 above, will also apply here.

STEP 3: LIAISE WITH POSSIBLE SOURCES OF PREDATORS

(1) Aim

The aim of Step 3 is to liaise with possible sources of major predators for release into Coutada 5, especially lion.

(2) Rationale and actions to be taken

All the major predators have disappeared from Coutada 5 due to unsustainable use and/or a dearth of prey animals. Since the policy of AFWR is to restock the denuded Coutada in an effort to recreate the wealth of wild animals that disappeared, thus creating a free-ranging wildlife population composed of different species, it stands to reason that the re-introduction of the major predators will be high on the agenda. None of the major predators occur in viable numbers in south-central Mozambique, thus necessitating AFWR to look further afield for animals to be restocked.

Hunting of lion in Botswana has recently been banned. The same applies to the hunting of lions kept in captivity in South Africa, the so-called unethical 'canned hunts'. Sources of lions may thus be readily available in especially South Africa.

By re-introducing lion that were kept (and maybe also bred) in captivity to Coutada 5 may, should the program not be planned and executed properly, just lead to a transplant of the 'problem' of 'canned hunts' to Coutada 5. This will create a situation that will not be acceptable to AFWR. How this possible problem will be counteracted, is described below.

At this stage AFWR will, for practical reasons, concentrate on the release of only lion, with the other major predators following at a later stage.

(3) Threats

AFWR may not succeed in sourcing suitable lions for releasing.

STEP 4: PLAN AND ERECT SUITABLE HOLDING/BREEDING CAMPS

(1) Aim

The aim of Step 4 is to erect suitable holding/breeding camps for the release of lion into Coutada 5

(2) Rationale and actions to be taken

The ideal would have been to release wild 'lion', taken from free-ranging populations elsewhere, into Coutada 5. This would have necessitated the core wildlife-wilderness block to have been fenced and fully stocked with viable populations of prey species, which will not be the case for some years to come.

In the meantime, the only other alternative would be to release lion into temporary holding camps. The camps should be suitable to also allow for the breeding of the animals.

The exact layout of the camps, and the type of fencing to be used to make the camps lion-proof, is in the process of being planned by the **preparation of an Operational Plan** . A number of smaller camps will be needed, but the main holding camp may be as large as 1 000 ha.

(3) Threats

AFWR can rely on a mass of experience that is available on how to successfully keep lion in an enclosed area.

STEP 5: RE-INTRODUCE THE SELECTED SPECIES OF PREDATORS TO HOLDING/BREEDING CAMPS

(1) Aim

At this stage only lion are considered for re-introduction, and the aim of Step 5 would be the actual re-introduction process to the holding/breeding camps

(2) Rationale and actions to be taken

The re-introduction process will to a large extent be guided by the composition and origin of the lion groups. It is likely that most releases will initially be confined to smaller holding camps.

STEP 6: MAINTAIN THE WILDNESS OF THE RE-INTRODUCED SPECIES

(1) Aim

The aim of Step 6 is to ensure that the 'wildness' of the released lions are maintained

(2) Rationale and actions to be taken

It is not the intention of AFWR to end up creating a zoo setup. Should such an event materialize, it will be directly contrary to the mission and objectives of AFWR, namely to rehabilitate the Coutada and to restore the wildlife. Every effort will thus be taken to ensure that the lions that are kept in the holding/breeding camps are as 'wild' as possible.

To maintain (or create) wildness, even in animals that were bred and kept in captivity in smallish enclosures, the feeding of the lion will be done in such a way that they cannot associate humans with the actual provision of food to them. It is envisaged that an automatic release system for the meat will be used, with the caretakers being sheltered behind screens.

The objective is to allow the lions in the main holding camp, to predate on animals released into the camp. Because of the unavailability of wild animals to serve this purpose, a breeding facility for donkeys and goats is envisaged. These animals will be released into the main holding camp.

Once free-ranging lion populations have been established in the core wildlife-wilderness area of 210 000 ha, any qualms about 'tameness' and 'artificiality' will disappear.

(3) Threats

The lion relocation project may be threatened by the international conception (which is in most cases unfortunately true) that any lions kept in escape-proof enclosures are tame or 'canned', and thus not suitable for hunting purposes. This real threat will have to be countered by ensuring that the lions that are earmarked for hunting, are 'wild', are able to catch their own prey and are kept in a large enclosure. Any semblance of 'canned' hunts on lions will be avoided at all costs.

STEP 7: MARKET/MAKE AVAILABLE SURPLUS ANIMALS FOR HUNTING OR LIVE RELOCATION

(1) Aim

The aim of Step 7 is to market, or make available, surplus lions for hunting or live relocation

(2) Rationale and actions to be taken

The rehabilitation of Coutada 5 and the restoration of the wildlife, linked to the extensive social action plans, will be a hugely costly exercise. Many of the developmental expenses that will be burdened by AFWR, will have very little bearing on the development of a purely conservation-based project. To rehabilitate and restore a protected area of 687 000 ha, would normally be a function of a public institution. In Mozambique, given the state of the economy and the continual struggle to balance the budget, it is unfortunately almost totally impossible for the GoM to shoulder this responsibility.

AFWR will thus have no other option but to try and enlist donor assistance, and to utilise the available renewable natural resources as effectively and profitably as

possible. It will be some time before the wildlife re-introduction program will yield a sustainable crop, but lions kept in enclosed areas can in the short term provide a source of income to the company. Excess lions will thus become available for either translocation to other areas, or for hunting by trophy hunters, or both. The quota that will become available for off-take will be determined annually, and will be marketed accordingly.

(3) Threats

AFWR will have to ensure that the threat of offering 'canned' hunts that may arise from the consumptive use of lions kept in enclosed areas, is removed by *not* offering hunts that may fall into this category.

STEP 8: RELEASE FOUNDER POPULATIONS OF SELECTED PREDATOR SPECIES INTO THE CORE WILDLIFE-WILDERNESS ZONE

(1) Aim

The aim of Step 8 is to ensure the release of a viable population of free-ranging lion into the core wildlife-wilderness area

(2) Rationale and actions to be taken

In keeping with the mission and objectives of AFWR for Coutada 5, the objective of restoring the wildlife of Coutada 5 to as natural a state as possible, will also include the full spectrum of predators. The core wildlife-wilderness block is at 210 000 ha more than large enough to maintain healthy populations of both prey and predator alike. All the major predator species, including lion, leopard, cheetah, spotted hyena and African wild dog, are earmarked for re-introduction. At the onset, however, only lion should be readily available for such releases. This will be done as soon as the prey populations have reached numbers where sustained predation will be possible.

Even though 210 000 ha is a large tract of land in conservation terms, it is ultimately still a fenced area that cannot possible function as an ecosystem where management interventions will not be needed. Predator species, in common also with the herbivores, will thus be managed according to the principle of adaptive management as outlined elsewhere in this BBP.

(3) Threats

The numbers of lions may increase to a level where especially the scarcer and more expensive prey species may be at serious risk due to excessive predation. This possible threat will be countered by controlling the numbers of the predators, whether by live capture and exporting, by trophy hunting or as a last resort by culling.

STEP 9: MAKE BENEFITS, AS PRESCRIBED IN THE SOCIAL ACTION PLANS (SEE BELOW), AVAILABLE TO THE LOCAL COMMUNITIES

(1) Aim

The aim of Step 9 is to ensure that all the consumptive-use-based benefits as described in the social action plans (see below), are indeed made available to them.

(2) Rationale and actions to be taken

Two primary objectives of the Coutada 5 project are to ensure that the local communities are actively involved, and that they derive benefits from all commercial activities taking place in Coutada 5 (see discussions above and below). These activities include agricultural activities (dealt with elsewhere) as well as consumptive uses of the wildlife resources. The basic principle that is applied by AFWR in this regard is quite simple: if the goodwill of the people is needed to ensure the success of the venture, which is definitely the case, then they will have to be actively involved as far as is feasible, and they must benefit from the sustainable use by AFWR of the renewable resources in the Coutada. The objective will be to ensure that they relate positively to all the developments and activities of Coutada 5, preferably to the extent that they in time will come to regard the Coutada as a friendly and benevolent institution.

(3) Threats

Should the communities not relate to the Coutada as a benevolent institution providing real and tangible benefits to them, the chances of AFWR's objectives ever being realized are slim indeed.

CHAPTER D9: THE MARINE RESOURCES SUSTAINABLE UTILISATION PLAN

9.1 PREPARING A MARINE RESOURCES SUSTAINABLE UTILIZATION PLAN

Indications are that the marine resources of Coutada 5, and of the region immediately to the north of Coutada 5 towards Divinhe, have, in common with the use of terrestrial resources, reached unsustainable levels. A similar situation exists with regards to the utilization of the marine resources in the waters off Vilanculos to the south of Coutada 5.

Since the Indian Ocean coastline of Coutada 5 stretches for about 30m kilometers from south (near Machanga) to north (near Divinhe), the management of Coutada 5 should also have a responsibility towards marine resources, and not only the terrestrial resources. However, in the contract with the Government of Mozambique the terrestrial resources form the mainstay of the document. Furthermore, given the extremely depauperate state of the terrestrial wildlife that AFWR 'inherited', the huge size of the area that needs to be rehabilitated (687 000 ha) and restored, and finally the huge costs involved in the venture, AFWR decided to initially concentrate on the restoration and management of the terrestrial resources.

Although marine resources will of necessity be put on the back burner, certain underlying conservation principles will nevertheless be applied as soon as possible. This BBP will eventually be upgraded to also include a more comprehensive Marine Resources Sustainable Utilization Plan (MRSUP. In the meantime, AFWR should gradually become more involved in the sphere of marine resources.

9.2 PRINCIPLES AND POLICIES FOR THE SUSTAINABLE USE OF MARINE RESOURCES

9.2.1 The context for the sustainable use of marine resources

With regards to the geographical context, AFWR should become involved in ensuring the sustainable use of marine resources. Politically the local government will probably welcome assistance from AFWR in 'policing' the use of some of the fragile marine coastal systems. The same applies to the developmental context: the development of Coutada 5 should take cognizance of the probable over-exploitation of the marine resources along the Coutada coast. Strategically speaking, AFWR should therefore position itself to become involved with the protection of these resources.

9.2.2 Lessons to be learned

Prior to the preparation of a plan, including a Marine Resources Sustainable Utilization Plan (MRSUP), certain provisos should be considered:

- Is the time ripe?
  - In the case of a MRSUP for the coastal waters Coutada 5, the answer is 'yes' the time is indeed ripe for action.
- Can AFWR deal with the scale of the plan?
  - The answer is unfortunately, at this stage, 'no', AFWR does not have the capacity to deal with the preparation and implementation of a MRSUP
- Is the project size controllable?
  - A marine conservation project of this nature is unfortunately currently beyond the capacity of AFWR to cope with.
- Can the objectives be effectively communicated?
  - Yes, the objectives of a possible MRSUP can certainly be communicated to the local role players.
- Who needs to participate?
  - All the stakeholders will need to participate, especially the people who are directly involved with the use of marine resources.
- Has marine resources control been decentralized?
  - Whilst the local law enforcement structures certainly have the power and authority to act, it seems as if their priorities lie elsewhere. There are just not enough local capacity to deal with all the problems that need attention.
- Can adequate human resources be harnessed?

    - AFWR currently do not have the capacity to allocate human resources to a MRSUP
- Has the costs and benefits been considered?
    - AFWR of necessity concentrates on the huge diversity of terrestrial and social actions that are being implemented. The local users of marine resources will in any case not perceive the objectives of a MRSUP to be in their long-term best interests, unless a fully fledged plan can be drawn up and implemented. Only then will they receive adequate benefits.
- Can partnerships be established?
    - Partnerships with the local authorities and also with the local fishers/harvesters can certainly be established.
- Can the local private sector become involved?
    - The local private sector consist primarily of the fishers/harvesters, and they should be directly involved with any MRSUP
- Can the use of marine resources be monitored?
    - Unless local representative community associations can be established, who will be tasked to undertake monitoring, the local use of marine resources will be impossible
- Can research be undertaken and data collected?
    - AFWR currently do not have the capacity to undertake any research and collect data.
- Will the preparation and implementation of a MRSUP be sustainable?
    - At this stage, the answer is unfortunately 'no'
- Who will 'own' the MRSUP?
    - Should a MRSUP be prepared and implemented, 'ownership' will need to be vested in the local community association or committee.

9.2.3 Actions to be taken with regards to the preparation of a MRSUP

For the near future AFWR lacks the capacity to either prepare, or become extensively involved with, a Marine Resources Sustainable Utilization Plan. AFWR however do realize the need for such a plan to be drawn up and implemented, and will investigate possibilities to have tertiary education institutions undertake baseline research, and present recommendations as to the way forward. Such research will have to be sponsored by external sources. At this stage, AFWR will thus not become directly involved with either the preparation or the implementation of a MRSUP.

CHAPTER D10: CONSERVATION AND MANAGEMENT OF AMPHIBIANS, HERPETOFAUNA AND INVERTEBRATES: COUTADA 5

10.1 PRINCIPLES AND POLICIES

The rehabilitation of Coutada 5, probably the most important and pressing of all the project objectives, includes the restoration of the severely depleted terrestrial wildlife of the Coutada. It is at this stage uncertain whether the conservation status of the amphibians, herpetofauna and, to a far lesser extent also the invertebrates, are a cause for

concern. Enough baseline data is not yet available to make any meaningful assessments, but the second faunal survey that is scheduled for early 2014, should provide more answers.

10.2 MANAGEMENT OBJECTIVES

Until such time as AFWR has access to better information, the future conservation and management of especially the herpetofauna but to a lesser extent also the amphibians, will have to be based on the application of a number of standard principles and general objectives:

- To determine the status of the herpetofauna using appropriate survey techniques;
- To identify any species that may need additional or special conservation measures or management attention;
- To monitor the effects of the relocated herbivores on the habitat used by the herpetofauna in general, with specific attention to elephant and buffalo;
- To prevent any long-term deterioration of the preferred habitat of vulnerable and possibly endangered herpetofaunal species, such as bush clumps on termitaria;
- To include the herpetofauna in concerted educational actions as part of the Public Consultation and Disclosure Plan (PCDP; see Part H);
- **To compile, in due course, an OP dealing specifically with the conservation of herpetofauna.**

10.3 MANAGEMENT PRIORITIES, OPTIONS AND ACTIONS

From a herpetofaunal conservation perspective, the following needs to be recognized, addressed and provisionally undertaken:

- That the conservation status of the herpetofauna of Coutada may be poor
- That extensive baseline surveys will need to be undertaken to augment the superficial 2013 survey. Specific attention will be paid to priority species for conservation action.
- That the conservation of reptiles, including the crocodile, will receive specific attention in the Public Consultation and Disclosure Plan (PCDP, see Part H). The almost universal animosity towards, or fear of, especially snakes are probably as pronounced in Coutada 5 as anywhere else. Snakes and the crocodile are probably actively persecuted and man would be their greatest enemy. The fact that a relatively large section of the Coutada (210 000 ha) would be either be unpopulated by humans after completion of the resettlement program, or thinly settled by staff living in the core wildlife area, would undoubtedly lead to the removal of a major conservation threat and an improvement in the conservation status of reptiles.
- That an improvement in the conservation status of rare and possibly endangered herpetofaunal species will come about should the preferred habitat of these species be properly protected.
- That the frequent and ecologically damaging fires that still occur on an annual basis will need to be managed, especially with regards to sensitive plant communities such as

bushclumps on termitaria, thus benefiting the scarce and/or rare herpetofauna that are predominantly restricted to those areas.

- **That an OP will need to be compiled dealing with the conservation and management of priority species of amphibians and reptiles**

CHAPTER D11: REGIONAL CONSERVATION STRATEGY

11.1 PRINCIPLES AND POLICIES

Coutada 5, with the possible exclusion of the to-be-fenced wildlife core areas, where suitable species of wildlife will be re-introduced and internally controlled, cannot operate, nor be developed and rehabilitated, in isolation. Close co-operation with relevant regional structures will thus need to be established, as is described in the sections of this plan dealing with Transfrontier Conservation Areas (TFCA), community-based natural resources management (CBNRM), co-management procedures, the public-private partnership action plan (PPPAP), the preparation of a regional conservation action plan (RCAP), and the collaboration plan with Coutada 4.

11.2 MANAGEMENT OBJECTIVES

The objectives of the regional conservation action plan (RCAP) mentioned above, would include the following:

- To unite all the role-players and affected parties behind a common and mutually acceptable regional conservation action.
- To encourage the sustainable use of the region's biodiversity resources.
- To focus on those habitats and resources known to be subjected to or threatened by inappropriate and/or unsustainable developments and/or non-sustainable harvesting of natural resources
- To pursue the establishment of a public-private partnership with Coutada 4 and Zinave National Park.

11.3 THREATS

The proposed regional conservation action may be faced with the following real or possible threats:

- Lack of interest from one or more of the crucial role-players that will, in all likelihood, derail the process.
- Lack of funds to ensure that a proper regional conservation action plan is drawn up, implemented and monitored.
- Lack of wildlife resources to be relocated to the new public-private partnership venture

11.4 PLANNING ACTIONS

11.5 Planning action: Prepare a Regional Conservation Action Plan (RCAP)

CHAPTER D12: THE SUSTAINABLE AGRICULTURAL DEVELOPMENT PLAN FOR COUTADA 5

12.1 MANAGEMENT OBJECTIVES, PRIORITIES AND ACTIONS FOR THE SUSTAINABLE AGRICULTURAL DEVELOPMENT PLAN

12.1.1 Operational context

(1) Compilation of an agricultural development plan

At this stage of the agricultural investigation it is, notwithstanding the serious lack of sufficient baseline information as was pointed out above (see Part B), possible to propose a strategy for the agricultural development and to provide a layout for a Sustainable Agricultural Development Plan (SADP), as part of the Social Action Plan. The SADP that follows indicates the proposed route that the agricultural development should follow, but only delineates and defines the strategic activities for the initial phase of the plan.

The feasibility of the planned agricultural developments for Coutada 5 cannot be detailed at this stage, due firstly to the many aspects that are still uncertain, secondly to the unavailability of essential information, and thirdly to the complex and long-term nature of the development program. More information will be obtained and outstanding issues addressed, as the project develops. It would only then be possible to determine the feasibility of each project element and sub-project.

(2) Ownership of the project

The agricultural resources of Coutada 5 belong to the people that "own" and till the land legally. "Ownership" of the SADP, in all its facets, would thus also be vested in the local communities. However, as would be clear from what has been stated above and the following discussions, external management assistance and even direct and continual interventions would be needed in order to make the plan work. The principles of partnership and active participation as embodied in the developmental policy of co-management (collaborative management) as described elsewhere in the BBP will be applied, to ensure that the farming community retain collective control of the project and of their individual destinies, whilst operating within the parameters of the SADP

(3) Standardising on procedures and processes

In order to enhance the marketability and replicability of the management procedures and processes that will be used, the following model for the agricultural development of Coutada 5 is standardized according to other similar plans in the BBP. Many of the principles and explanations embodied in the other plans dealt with above, would *situ situ* also be applicable to the agricultural plan, and should be read in conjunction with the SADP that follows below.

12.1.2 Political and administrative context

The political and administrative context for the development and deployment of the SADP is the same as for the other plans discussed above. The agricultural resources of Coutada 5 can be regarded as a demarcated and controlled resource where the necessity of regional cooperation and compliance with regional frameworks, would not be as critical.

12.1.3 Developmental context and strategic framework

The agricultural development plan (the SADP) for Coutada 5 that follows below does not stand on its own. It is fully cognizant of, and fits into the larger development plan and BBP for the Coutada.

From the point of view of overall development on the Coutada the SADP takes particular note of and reflects the following developments and issues:

- The SADP will of necessity concentrate on the agricultural needs of the resettled households.
- The current level of knowledge of the agricultural scenario of Coutada 5 is inadequate and does not allow for a full and comprehensive SADP to be compiled. The structure of the SADP that follows below, makes provision for the plan to be adapted and the final phases completed as and when information becomes available.
- Rural development anywhere in the world is by nature a slow process. The development of people from a very low base in relation to technological know-how, exposure to modern techniques and literacy, takes both time and very sound developmental techniques and skills. The development of a SADP for Coutada 5 would thus be viewed as a long-term project requiring a long-term involvement and commitment from all role players.
- The proposed sustainable framework for the agricultural development is based on the information obtained to date. Two major development constraints that influenced the strategic framework are firstly the possible low nutrient value of especially the sandy soils, and the apparent current inadequate agricultural ability of the local community, especially about the to-be-introduced organic farming or permaculture system. The communities are conversant enough to produce for local consumption and mainly for household production, but their level of experience and agricultural capacity would be at the very lower end of the commercial agricultural production scale.
- The strategic framework for the SADP follows a phased approach with a gradual transition from one phase to the other. This provisional version of the SADP mainly involves and describes phases 1 and 2 of the process:
    - **Phase one** entails brief surveys of the areas where the resettled households will be established, with an analysis of the soils being on of the most important criteria.
    - **Phase two** entails the relocation of resettled households to new areas for habitation, and will prioritize the introduction of high production organic/permaculture techniques once they have settled in.

- **Phase three** entails the general enhancement of the present agricultural production methods (crops and animals) to a higher yield level in order to create a sustainable economical base and to move out of the present situation of seasonal uncertainties and poverty. The principle of organic farming or permaculture will gradually be established and phased in.
- **Phase four** entails the consolidation of high yield rain-fed cash crop production, possibly parallel to the establishment of permanent tree crops (such as cashew and coconut palms), further consolidation of the new organic farming process, and value adding to all the crops for export to markets outside of the production area.

12.1.4 Agricultural development vision and objectives

The overall agricultural development vision for the Coutada can be defined as follows:

To create an enabling environment, to provide the required inputs and to develop institutional arrangements, in order to establish a local agricultural industry to generate sustainable socio-economical livelihoods of the present community in the project area, and to provide viable livestock ranching opportunities for investors.

The specific AFWR objectives for the agricultural development of Coutada 5 can be summarised as follows:

(1) <u>The local smallholder farmers</u>

- To enhance the socio-economical status of the community involved in agricultural production, by assisting with the development of a stable society and by value adding (processing) of their produce for own use and commercial applications.
- To concentrate on, and achieve, the production of high yield, high quality organically grown cash crops, vegetables and livestock during the first phases.
- To progress to permanent crop production, such as perma-/aquaculture or organic farming, as soon as possible.
- To assist in the establishment of small-scale agro-industries, and ancillary agribusinesses such as mat weaving and the manufacture of reed furniture.

(2) <u>The investor livestock ranchers</u>

- To zone an area of approximately 100 000 ha, to the east of the EN1, where viable cattle ranches of at least 5 000 ha each could be established
- To make these prospective ranches available to investors, and to ensure that their security of lease is covered by a DUAT
- To ensure that the interests and long-term investments of the investors are safeguarded
- To make these prospective ranches available to investors
- To assist the ranchers in obtaining access to markets further afield, and access to a local abattoir

- To assist the cattle ranchers in obtaining access to an extension service

The specific objectives for the agricultural development of the Coutada can be summarised as follows:

- To enhance the socio-economical situation of the community involved in agricultural production by assisting with the development of a stable society and by value adding (processing) of their produce for own use and commercial applications.
- To concentrate on and achieve the production of high yield, high quality organically grown cash crops, vegetables and livestock during the first phases.
- To (possibly) progress to permanent crop production (for example cashew and coconut palms) to derive an income from export to the areas outside of the Coutada.
- To (hopefully) establish small-scale agro-industries to add value, e.g. slaughtered poultry, egg production, pre-packed vegetables, coconut oil, pre-packaged cashew nuts
- To establish ancillary agribusinesses such as mat weaving and the manufacture of reed furniture.

12.1.5 Lessons learned

The "lessons learned" section of the SADP is largely similar to the corresponding 'lessons learned' sections of other plans, and will not be dealt with in any detail. The following "lessons" were listed:

- Timing (the time is ripe to launch the sustainable agricultural program)
- Scale (the plan must be tractable and implemented in phases)
- Project size (the 12-point plan breaks the SADP down in manageable units)
- Communication (appropriate channels will be used to inform the local communities)
- Participation (the SADP must be community driven)
- Decentralization (use the local civil authorities wherever possible)
- The human resource (also involve women and youth)
- Cost and benefit (real benefits will lead to behavioral change)
- Partnerships (addresses the questions of who owns who and who gains what?)
- Private sector involvement (foster private sector initiatives inside the community)
- Monitoring and evaluation (with the farmers directly involved)
- Research and data collection (also with the farmers directly involved)
- Sustainability (build human capacity)
- Ownership (vested in the farmers; they carry the responsibility)

The results of many hundreds of agricultural development projects in developing countries have been fully chronicled. The successes and failures and the reasons for it are well known, as are the many pitfalls that should be avoided. In the case of Coutada 5 there would thus be no need to reinvent the wheel, although it has to be acknowledged that the concept of organic farming (permaculture) is still in its infancy in Mozambique and would thus necessitate some experimentation.

In other areas with similar nutrient deficient sandy soils, the system of organic farming has led to enriched soils. Composting in sandy soils add organic matter that helps with nutrient and water retention. Compost also increases the activity of soil microorganisms that release nutrients and other growth-promoting materials into the soil, and goes hand in hand with animal/poultry production.

The ecologically destructive slash-and-burn method of crop production as applied locally is oddly enough a form of organic farming, and does not involve the use of any inorganic substances (for example fertilizers) at all. The farmers should therefore easily relate to an advancement or refinement of a technique that has been in use for generations.

The local farmers will have to be involved in an active and participatory manner right from the beginning. The principle of co-management will be applied to ensure that the SADP becomes owned and driven by the local farmers themselves.

12.1.6 From lessons to principles

The principles that were considered and accommodated in the formulation of the SADP are generally similar to those used for the other sustainable plans discussed above and may be summarized as follows:

- The plan will be as simple as possible in terms of structure and execution, and will not necessitate extensive behavioral changes over a short period of time.
- The plan will not be built on sustained outside intervention and long-term funding, but implementation and accountability will be transferred to the “owners” of the resource as soon as possible.
- The plan will only succeed if the local communities perceive and experience the benefits to be real and sustainable.
- The SADP will be workshopped with the local people to ensure that psychological and functional ownership of the plan is vested in the “owners” of the resource, according to the principle of co-management.
- Without the formal community structures as outlined in the SADP below and elsewhere in the BBP being put in place, the implementation of the plan will be jeopardized.

12.2 THE SUSTAINABLE AGRICULTURAL DEVELOPMENT PLAN

12.2.1 A 14– point procedure for implementing a Sustainable Agricultural Development Plan for Coutada 5

A simple 14-step process, based on the same principles and procedures as the other sustainable plans, will be applied to the implementation of the Sustainable Agricultural Development Plan (SADP) for Coutada 5. The steps are interlinked in a chain that brings accumulative strength with every subsequent step added. Leaving one out, or not doing it thoroughly may cause the entire chain to fall short of the mark, and may cause the entire management process for agricultural development to fail entirely. It is important to note that some of the steps are

overlapping, and that some of them can be implemented concurrently rather than in a linear fashion.

The 14 steps are:

Step 1:	Identify the stakeholders
Step 2:	Establish the Coutada Community Agricultural Committee (CCAC), develop a vision and elect/appoint appropriate structures
Step 3:	Draw up a constitution for the CCAC
Step 4:	Obtain additional baseline information
Step 5:	Solicit donor funding
Step 6:	Plan the Phase 1 development of the SADP
Step 7:	Undertake an effective information, education and training program
Step 8:	Establish channels for meaningful contact/interaction and co-management with Coutada management and the CCAC
Step 9:	Implement the Phase 1 development of the SADP
Step 10:	Monitoring and evaluation of Phase 1
Step 11:	Plan the Phase 2 development of the SADP
Step 12:	Implement the Phase 2 development of the SADP
Step 13:	Monitoring and evaluation of Phase 2
Step 14:	Progress to Phases three and four

12.2.2 Application of the 14-point plan

For each of the steps the purpose is briefly noted, the rationale is given and discrete actions to be taken are listed. Finally, where applicable, an assessment of potential problems and dangers (threats) may be provided.

STEP 1: IDENTIFY STAKEHOLDERS

(1) Purpose

The purpose of Step 1 is to identify all the stakeholders who should be involved in the development of the SADP.

(2) Rationale

At the beginning of this phase, a suitable candidate for the post of Agricultural Extension Officer will need to be recruited and appointed.

The rehabilitation project of Coutada 5 will have no effect on the ownership of the Coutada's agricultural resources: it will remain vested in the local communities, and specifically the farmers who have legal 'title' to the land that they use. However, a number of smallholder farming households will be resettled from the core wildlife-wilderness zone, to make way for the establishment of a reserve area set aside for the restoration of the severely depleted wildlife.

The agricultural role players can be identified as follows:

- The agricultural stakeholders will include all those inhabitants of the Coutada who are in some way or other involved with, or dependent on, agricultural practices. They are thus an identifiable group.
- The farming community is composed of smallholder farmers with each family farming a specific unit of land. The agricultural stakeholders will thus be involved as a uniform group with a common bond or interest, but consisting of individuals or households, each with different expectations and capabilities.
- The resettled farmers will be regarded as a specific sub-group and will be targeted for preferential attention according to the SADP
- Within the group of farmers, a further sub-group that will be identified are those individuals who exhibit the potential, based on their current performance as farmers, to become practitioners and proponents of the system of organic farming.

(3) Actions to be taken

- The results of the population census and the social impact assessment that is currently underway will be available by the fourth quarter of 2013, and will serve to identify all the farmers and where they live.
- Two priority sub-groups will be specifically identified, namely the resettled farmers (who deserve special assistance) and farming leaders (who can become influential supporters of the sustainable agriculture program)
- A series of community meetings will be held to inform the farmers of the new agricultural development program, secondly to inform them of the planned establishment of the CCAC, and finally to nominate persons to represent them at the meeting where the CCAC will be formally established.

STEP 2: ESTABLISH THE COUTADA COMMUNITY AGRICULTURAL COMMITTEEE, DEVELOP A VISION AND ELECT/APPOINT APPROPRIATE STRUCTURES

(1) Purpose

The purpose of Step 2 is to establish structures to represent the farming community's interests.

(1) Rationale and actions to be taken

It will be totally impossible to involve the amorphous mass of people inhabiting the Coutada as a single entity in the development of a sustainable agricultural program for Coutada 5. However, the same democratic principles built into the other sustainable plans outlined above, will be applied in this case too.

At the series of mass meetings for farmers that will be held (Step 1), the objectives and establishment of the Coutada Community Agricultural Committee (CCAC) will be discussed. A

draft mission, vision and objectives will also be discussed, as well as terms of reference for the committee.

The following aspects and principles will guide the establishment of the sustainable agriculture management system:

- Membership of the CCAC will, due to the relatively large number of farmers living in the Coutada, initially be limited to elected representatives or delegates from the resettled farmers, from the host community and one or more of the local traditional leaders.
- Knowledgeable outsiders will be co-opted onto the CCAC, for example representatives from the District Administrator's Office in Machanga, including the District Director for Agriculture and Rural Development.
- The planning and establishing of a Sustainable Agriculture Program (the end result of the SADP) for Coutada 5 will be dependent on specialized inputs from agricultural experts, who would need to qualified in dealing with organic farming/permaculture and with unsophisticated farmers. Experience in the Mozambican context would be a prerequisite. Initially, the real management inputs and actions in setting up and monitoring the agricultural program will thus of necessity be the responsibility of a (contracted) specialist(s)
- To ensure meaningful participation in the process by the "owners" of the land, the duties and responsibilities of the CCAC will make provision for direct and ongoing dialogue with AFWR management.

A representative from the District Administrator's office in Vilanculos, hopefully the District Director of Agriculture and Rural Development, will be invited to serve on the CCAC.

The CCAC will be a specialized sub-committee of the over-arching Community Trust, who will be the democratically elected body representing the local communities residing in Coutada 5 (see Part L).

STEP 3: DRAW UP A CONSTITUTION FOR THE CCAC

(1) Purpose

A constitution will need to be drawn up to regulate the activities of the CCAC

(2) Rationale and actions to be taken

A concise but clear constitution for the CCAC will be necessary to ensure that the vision, mission and objectives of AFWR and the committee are met. The constitution will spell out the responsibilities and actions of the various role players involved with the development of a sustainable agricultural program for Coutada 5, as well as the procedures to be followed to ensure orderly operations. A grievance redress mechanism and procedure will be built into the constitution, to ensure that any grievances that could not be resolved internally within the CCAC structures are timeously addressed and resolved.

The constitution will be compiled by AFWR, and approved/accepted by the CCAC.

STEP 4: OBTAIN ADDITIONAL BASELINE INFORMATION

(1) Purpose

To provide additional baseline information that is needed to launch and maintain an effective sustainable agricultural program for VCWS.

(2) Rationale and actions to be taken

At this stage, the dearth of baseline information on the agricultural scenario in Coutada 5 rules out any possibility of implementing a large-scale sustainable agricultural program. The major shortcomings are an absence of aerial photographs to assist with the plotting of households and cultivated fields, and a total absence of reliable soils data. A soil survey will need to be undertaken in the areas selected for the resettlement of people.

STEP 5: SOLICIT DONOR FUNDING

(1) Purpose

The purpose of Step 5 is to solicit donor funding in order to assist AFWR with the funding of the relatively expensive agricultural program.

(2) Rationale and actions to be taken

As has already been pointed out, it would not normally be expected of a biodiversity-based private development company to have to resettle smallholder farmers from an officially protected area, to localities where they must set up and establish new agriculture-based livelihoods. In the case of the rehabilitation of Coutada 5, a number of households have to be resettled out of the core wildlife-wilderness zone, to areas that are zoned for community use.

The resettlement costs will include cash compensation, the donation of some farming equipment, the donation of household utensils, assistance with relocation, and assistance with the building of new houses. Once the farmers have settled in at their new localities, they will have to be directly assisted and trained to become involved with new modern production techniques, such as permaculture. Seed capital to establish the new agricultural ventures will be needed. In order to rehabilitate Coutada 5 and restore the wildlife that were decimated, AFWR will be faced with a tremendously expensive but inescapable conservation-based program. Internal funding for the implementation of the social action plans will just not be available.

(3) Threats

If donor funding should not be forthcoming for the new agricultural production techniques, the whole project will be jeopardized. The resettlement program will have to be executed before the core wildlife-wilderness block can be rehabilitated, and should it prove to be impossible to

resettle the people, then the conservation and rehabilitation program may also fall by the wayside.

STEP 6: PLAN THE PHASE 2 DEVELOPMENT OF THE SUSTAINABLE AGRICULTURAL DEVELOPMENT PLAN (SADP)

(1) Purpose

The purpose of step 6 is to plan the implementation of the first phase of the SADP (steps 7 to 10 below) to ensure that the objectives for the program are met, and to establish a pilot project.

(2) Rationale and actions to be taken

The implementation phase can only commence after completion of a number of operational plans, and obviously also only after completion of the resettlement action. The next steps of the SADP will thus be dependent on the following **OPs being prepared:**

Pilot project: In order to provide a hands-on experience to farmers, AFWR will select a site for a pilot project and will establish, in partnership with the smallholder, an operational organic farming joint venture. This facility will be used for demonstrative and training purposes.

Agricultural land use plan: The land use plan will consider aspects such as the following:

- The need to involve the community in the planning process through the abovementioned CCAC
- Appropriate steps need to be taken to minimize or prevent agriculture-induced damage to the natural resources, such as water, soil and natural vegetation
- Establishing the system of organic farming, including measures such as mulching of bare soils, mixed tree cropping, inter cropping, prevention of excessive runoff from rainwater and composting
- Rejuvenation of the soil fertility
- Controlling slash-and-burn agriculture

Crop use plan: The crop use plan will need to involve the following aspects, considerations and actions:

- The selection of suitable crops will be determined by:
    - The agricultural production model that is selected.
    - Crops that are currently cultivated by the farmers would be the first priority; they already have the experience and knowledge of the local crop potential.
    - The soil suitability and related natural resources.
    - Family food security and local potential market demand for the specific crops.
- Identifying suitable agricultural development models and management models:
    - The current farming system in use depends on the ecologically destructive slash-and-burn technique, ostensibly to maintain adequate levels of plant nutrients. It is a practice which has been in existence for many generations and has generally succeeded in meeting the personal food requirements of the people. However, the natural population expansions will eventually render the low-production

practice unsustainable as the rotation from the land progressively shortens and production declines.

- Introducing alternative measures to improve and maintain soil fertility will thus be a first priority. Implementing a new agricultural production system, and improving soil fertility is a long term and expensive process, particularly on free-draining sands. Some of the technologically appropriate measures will involve:
  - Conservation of organic matter such as crop residues and farmyard manure, for example chicken and goat litter and composting of plant residue. A major drawback with this practice is the relatively poor plant biomass production, both natural and anthropomorphic, in the area.
  - Reducing the dependence on annual crops such as maize, mapira, cassava and sugar cane, by introducing more fruit bearing trees that are adaptable to the area such as cashew, coconut and citrus trees. These fruit bearing trees are less demanding on plant nutrients than annual crops and causes little disturbance to the topsoil.
  - Inorganic fertilizers will be considered as a last resort and only to ensure that farmers meet their subsistence food needs. Inorganic fertilizers are fast acting and would thus be an effective remedy for the current imbalances in the soil. Inorganic fertilizers would only be used (if at all) as part of a long term plan to build up soil organic matter by means of organic farming (permaculture) and the use will be restricted to the initial stages of the program.
- The introduction of fruit trees (Mango, Cashew, Coconuts and Citrus) through an out-growers program will possibly be included in the crop production plan. Fruit trees will be introduced that are disease resistant, quicker to full production and adapted to the climate. The agricultural extension officer can possibly manage a tree nursery (see below) and can hand out the plants to the farmers at the transplanting stage. Training in planting methods, spacing, farming management and disease control would have to be undertaken (see Step 7).

Livestock and poultry production plan: One or both the following options may be considered:

- Fowls for Africa is a South African-based program specifically developed for poor communities where chicken breeds that are adapted to the specific local conditions are introduced into the community. Indigenous chickens that are disease resistant and in this case also heat tolerant, are bought and sold (for a minimal sum) as breeding stock to individual farmers. These breeds are good layers and produce tasty meat.
- Egg production is feasible where the hens are bought at point-of-lay and kept for a laying season of one year. During this period they are expected to produce 240-250 eggs each under conditions of natural daylight. The hens are slaughtered at the end of their production cycle. Enough eggs can thus be generated not only for own household consumption but also for selling.

Capacity enhancement and training plan: The training program of Step 7 will be based on a proper **OP being prepared**. The following capacity enhancement and training aspects will be addressed in the OP:

- The farmers and the community at large would need to be convinced of the need for proper resource utilization and conservation, i.e. to fully exploit the environmental opportunities of the area in a sustainable manner.
- The establishment, operation and management of a community-driven farmer's committee (the CCAC).
- The establishment of community-based institutions to deal with non-agricultural aspects such as clean water, health and entrepreneurial development. This aspect will probably be dealt with by the Community Trust.

Storage and marketing plan: It can be foreseen that, with the improved agricultural techniques that would be applied on soils with improved fertility, surpluses of grain, fruit and even fresh produce will be produced. These surpluses will have to be storaged by upgrading the current unsatisfactory system, by providing a suitable transport system to the market, and by developing a market. These aspects will be **dealt with in the OP.**

Infrastructure development plan: The sustainable agricultural program will not involve a collective farming system, which means that the individual farmers will operate according to a free enterprise philosophy and would be masters of their own destinies. Each farmer will thus have to provide his own infrastructure, concomitant with his production capabilities. AFWR will assist the resettled farmers in this regard. A rudimentary level of infrastructure will also be needed to manage the SADP, for example office facilities for the extension officer and administrative space for the community association and committees. (The OP for this activity will be included in the plan for the following item)

Implementation resources plan: The **implementation resources OP** will *inter alia* provide for the following:

- The recruitment, training and application of an extension officer.
- Determining the manpower needs (full-time and part-time) to operationalize the SADP
- Determining the support services and equipment that will be needed to implement the SADP
- Determining operational costs and compiling and managing a budget

Farmer's resettlement plan: Possible relocation areas for the resettling agricultural households will be identified as part of the Resettlement Action Plan (RAP; see below).

STEP 7: UNDERTAKE AN EFFECTIVE INFORMATION, EDUCATION AND TRAINING PROGRAM

(1) Purpose

The purpose of Step 7 is to inform the local communities of the agricultural program in general, the specific objectives of the program and the role of the communities and the to-be-established community structures, and to ensure that all role players are adequately trained.

(2) Rationale and actions to be taken

The Coutada 5 agricultural fraternity, which includes most of the people living in the outlying regions of the Coutada, has had virtually no access to modern (or at least modernized) agricultural techniques and principles in the past. They were pretty much left to their own devices and could not rely on any co-operative support, financial assistance, production or development loans, modern implements or proper training, and had at best only access to a rudimentary extension service.

Now all of this will have to change. Any continuation of the old systems and procedures will lead to a further deterioration in the agricultural environment, and the growing human population will increasingly be faced with food shortages. The implementation of new techniques such as organic farming is long overdue and could be regarded as a necessity, but will nevertheless confront the farmers with a new and strange situation. The first priority group for the new organic farming system will be the resettled farmers.

The following steps will have to be taken to ensure that the farmers are informed, educated (agriculturally literate) and trained:

- During a series of community meetings as discussed above the new sustainable agricultural plan will be "sold" to the farmers, and the vision, objectives and expected benefits of the SADP will be shared with them. These meetings will be arranged by AFWR, with the direct involvement of the CCAC. The first meetings will take place during Step 2, will be followed up during this phase (Step 7) and thereafter as often as necessary. The meetings will probably later develop into proper "farmer's days" with the accent on demonstrations of successful operations, specifically the pilot project, and the evaluation of successful ventures on the ground. The local agricultural extension officer will play a leading role in presenting the farmer's days.
- The SADP will be one of the major focus areas of the public consultation and information disclosure program (PCDP) for Coutada 5 (see Part G).
- An extensive training program will be built into the SADP. The training plan will be drawn up during Step 6 (see above), and will be implemented during this phase (Step 7) and later phases. The training program will include orientation/demonstration visits to the pilot organic farming venture in the Coutada, and will be undertaken by the local extension officer.

The SADP will be based and developed on the principle of co-management. Throughout the process as outlined above, the farmers themselves, through the CCAC, will be involved to give effect to this policy. The ideal would be if, in time, the CCAC as the agricultural voice of the Community Trust, could take over control of the program with AFWR staff acting in a support role only.

A grievance redress mechanism will, in common with the terrestrial wildlife programs discussed above, be built into the agricultural program and the procedures to be followed in dealing with a grievance, will be made known to all role players.

STEP 8: ESTABLISH CHANNELS FOR MEANINGFUL CONTACT/ INTERACTION AND CO-MANAGEMENT BETWEEN AFWR MANAGEMENT AND THE COUTADA COMMUNITY AGRICULTURAL COMMITTEE

(1) Purpose

The purpose of Step 8 is to establish effective channels of communication between all role players who will be involved with the SADP.

(2) Rationale and actions to be taken

The rationale and implementation actions for establishing effective contact/interaction in the agricultural program, are almost identical to the procedures to be followed for the terrestrial wildlife program discussed above.

After the establishment of the CCAC, procedures will have to be put in place to allow meaningful and effective two-way communication between the CCAC on the one hand, and the Coutada 5 management staff and structures on the other. Open lines of communication must also be established with the Community Trust (see Part L)

The CCAC should find it relatively easy to become and remain involved in co-management or collaborative ventures involving the agricultural resources. The farmers will in theory at least, be the driving force behind the agricultural management actions. It is unlikely that this ideal situation will be established from the onset, but it should develop over time.

The agricultural program structure as indicated above (the CCAC) will represent the agricultural community, whereas the following channels of communication, actions and/or policies to be communicated and procedures to be followed are envisaged:

- The SADP, as well as all the other plans that will have an impact on the agricultural program, will be workshopped with the appropriate community structure (CCAC).
- The CCAC will have an open and direct channel of communication to appropriate AFWR management staff. If the CCAC should so choose, they may also channel the communication through the Community Trust.
- These communications or contacts may be on a personal basis (handled by one or more delegates) or in written format, and may be formal (a pre-arranged meeting or a letter) or informal. In all instances, irrespective of the mode of communication that was used or the type of contact, the responsible AFWR staff will minute the proceedings and will provide a copy to the CCAC
- Coutada management staff will meet with the CCAC on a frequent basis, but not less than quarterly. Either party may request more frequent meetings if the need should arise.
- At the quarterly meetings, AFWR staff will present a quarterly report (verbally and in writing) to the CCAC. Particular attention will be paid to any problems, possible changes to policies, finances and marketing.

- The CCAC will meet with the Community Trust on a six-monthly basis, which meetings will be attended by AFWR management staff. The proceedings of all meetings will be minuted and the minutes will be distributed to all concerned.
- AFWR management staff will, during the setting up period, assist the CCAC in the administration of their activities with regards to record keeping and filing.
- AFWR management will prepare and submit an annual report on the agricultural program to the CCAC and the Community Trust. This report, as well as the other formal reports dealt with above, will also be available in Portuguese.

STEP 9: IMPLEMENT THE PHASE 2 DEVELOPMENT OF THE STRATEGIC AGRICULTURAL DEVELOPMENT PLAN

(1) Purpose

The purpose of Step 9 is to implement the planned and programmed actions of the preceding steps of the process, and to get the sustainable agricultural program operational.

(2) Rationale and actions to be taken

The precise details of the Phase 2 implementation program will only be known once meaningful progress has been made with the preceding steps.

The implementation program will to a large extent rely on ongoing inputs by the full-time local AFWR extension officer.

The implementation program may involve the following actions:

- Visits to the pilot project.
- An intensified agricultural extension and training program. Training in specific aspects of farming will be provided, preferably by private sector institutions involved in product sales and services.
- Provision of inputs particularly for maize, cassava and seedlings for vegetables, and later fruit trees. Improved cultivars better adapted to the tropical climate will be used.
- Identification and development of markets for farmer produce.
- Improved methods to store food supplies and seeds will be investigated and implemented. Training and assistance in the effective storage of surplus products and seeds will have to be given.
- An economically sustainable farming program will be heavily influenced by the ability of the farmers to get their excess produce to markets. The development of reliable access routes to the markets will be a prerequisite for an economically sustainable farming program.
- The implementation process will very much be a hands-on and practical process of teaching, training, demonstrating, mentoring, support, motivation etc.

STEP 10: MONITORING AND EVALUATION OF PHASE 2

(1) Purpose

The purpose of Step 10 is to monitor and evaluate the effectiveness of the sustainable agricultural program, as embodied in the SADP, to date.

(2) Rationale and actions to be taken

Monitoring and evaluation principles and procedures are indispensable in developments of this nature. Therefore the monitoring and evaluation project should be considered an integral component of the agricultural development process.

The primary focus of the sustainable agricultural program will be on the successful re-establishment of the resettled households in particular as a first priority, and the improvement of agricultural productivity in general. Important objectives and/or criteria to be monitored therefore include the following:

- Success of the organic farming enterprise
- Co-management successes
- Improved crop yields
- Selling surplus products
- Enhanced household food security
- Improved earnings
- Enhanced knowledge
- Sustainable environmental management

STEP 11: PLAN THE PHASE 3 DEVELOPMENT OF THE SADP

(1) Purpose

The purpose of Step 11 is to plan the implementation of the third phase of the SADP (steps 12 and 13 below) to ensure that the objectives for the program are met.

(3) Rationale and actions to be taken

Phase 3 (see above) entails the consolidation of high yield rain-fed cash crop production parallel to the establishment of permanent tree crops (cashew and coconut palms), further consolidation of the new organic farming process, and value adding to all the crops for export to markets outside of the production area. Phase three will gradually follow phase two as the community masters the improved production and marketing opportunities that would firstly be partially based on present practices, and secondly the introduction of organic farming.

It is obviously at this stage not possible to elaborate on actions to be taken during the planning process for Phase 3, but the principles and rationale would be similar to those for Phase 2 (see especially Step 6 above).

STEP 12: IMPLEMENT THE PHASE 3 DEVELOPMENT OF THE STRATEGIC AGRICULTURAL PLAN

The underlying principles that need to be applied are basically the same as those indicated for Phase 2 above, and will thus not be repeated

STEP 13: MONITORING AND EVALUATION OF PHASE 3

Purpose, rationale and actions to be taken

Although the purposes, rationales and actions for the implementation and monitoring and evaluation of Phase 3 will obviously not be precisely identical to those of Phase 2, the principles and broad application will be the same (see Steps 9 and 10 above). The detail cannot be provided at this stage.

STEP 14: PROGRESS TO PHASES 3 AND 4

Purpose, rationale and actions to be taken

Phases 3 and 4 entails the consolidation of high yield rain-fed cash crop production, possibly parallel to the establishment of permanent tree crops (cashew and coconut palms), further consolidation of the new organic farming process, and value adding to all the crops for export to markets outside of the production area. The underlying implementation principles are the same as those for Phases 2 and 3 above, and will not be repeated here.

12.2.3 Operational Plans

A number of OP's have been identified above for the second phase of the SADP and will need to be prepared at the appropriate stages.

Original signpost dating back to 1972


Mud flats and salt marshes with mangrove on the Indian Ocean coast

Intertidal zone with mangroves

Delta of the Save River

Mangrove swamps

Deciduous woodland with seasonally inundated open grass plains and freshwater lakes

Rice paddies and mangroves

Seasonally inundated grasslands

Open deciduous woodland with Mopane savannah

Open short grass Mopane scrubland

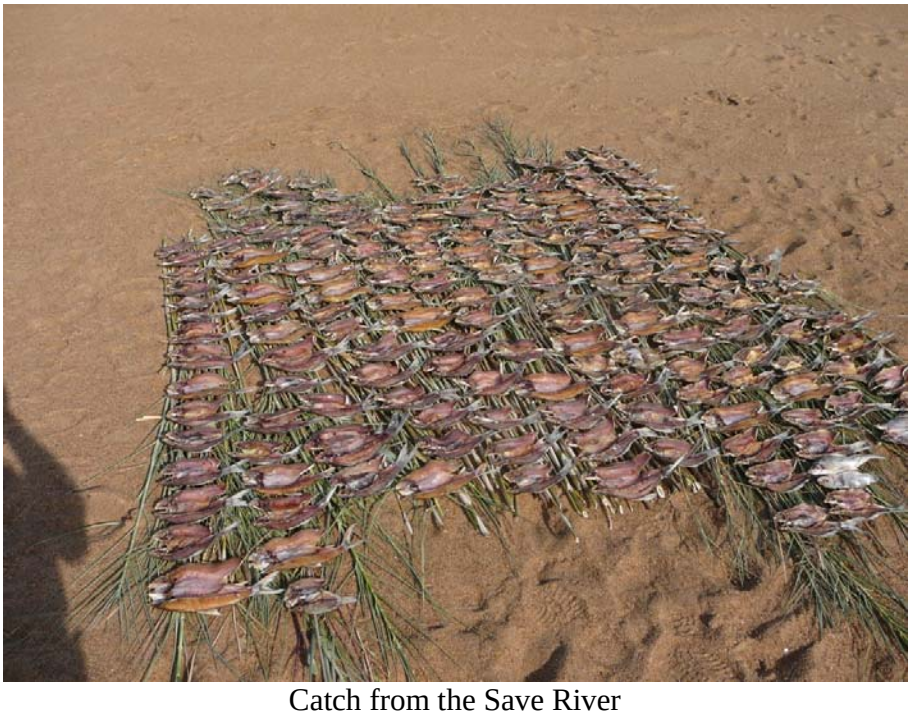
The Baobab Special Preservation Area with 76 Baobabs on 8 hectare

Floodplain of the Save River

Floodplain of the Save River; most of the floodplain has been irreversibly altered by human impacts

Fresh water lake on the Save floodplain

Save River in mid-winter



Catch from the Save River

Hippo in the Save River

A tented chalet at Camp Buffalo lodge

Solar power system at Buffalo Camp lodge

Solar power water heating at buffalo Camp lodge

Solar power battery system at Buffalo Camp

Water purification system at Buffalo Camp lodge

Control unit of the water purification system at Buffalo Camp

Workshop at headquarters

Restaurant at Buffalo Camp

Kitchen staff at Buffalo Camp

Vegatation survey

Poachers' and palm wine distilling camp

Midwinter pool in the Muar River

Midwinter pool in the Bunga River

Michema palm wine making, the Hyphaene palm will probably die off

Transporting palm wine

Riparian woodland of the Repembe River

Mid winter pools in the Repembe River

Midwinter pool in the Muar River

Midwinter pool in the Bunga River

Transition zone between Mopane savannah and Miombo Woodland

Miombo woodland with *Brachystegia bussei prominent*

PART E: EXPANSION, RESTORATION AND PUBLIC-PRIVATE PARTNERSHIP: COUTADA 5

CHAPTER E1: EXPANSION AND PUBLIC-PRIVATE PARTNERSHIP ACTION PLAN

1.1 INTRODUCTION

The size, location and official objectives of Coutada 5 have, as is also the case with the other Coutadas in the country, been determined by the Government of Mozambique at the time when the Coutada was established. At the time of their establishment (mostly in the late 1960's and early 1970's) all the Coutadas were apparently prime wildlife habitat, harbouring a uniquely local biodiversity in great abundance. The Coutadas were therefore, not surprisingly, earmarked as hunting blocks, or Controlled Hunting Areas. The rural areas where the Coutadas were established, including Coutada 5, were at the time very sparsely settled by humans.

Today, however, much has changed in all of the Coutadas. In the case of Coutada 5, as has been pointed out, the erstwhile abundance of wildlife species, and their numbers, was decimated to the brink of local extinction in some cases, whilst a number of especially large-game species totally disappeared locally. Furthermore, the human population in Coutada 5, spanning as it is the whole district of Machanga, increased considerably. In recent times, especially since the signing of the peace accord bringing an end to the civil war in 1992**,** human settlements increased dramatically along the Rio Save, along the EN1 and also in the environs of the town of Machanga.

From a Coutada 5 point of view, this increase in human settlements inevitably led to a concomitant decrease in available wildlife habitat, as well as to unsustainable use of the wildlife resources. Normally, these two events would have been the death knell of any protected area. However, the saving grace of Coutada 5 lies in its huge size: 687 000 ha. Even if the current settled areas are discarded as future wildlife protected areas, the remainder of Coutada 5 is still more than large enough, to be developed and rehabilitated as a viable protected area. Large undeveloped areas of the Coutada are, indeed, also earmarked to be developed as extensive cattle ranching ventures.

AFWR thus regard Coutada 5 as a viable unit, notwithstanding extensive but localised anthropogenic impacts. The expansion of Coutada 5 *per se* is thus not necessary, nor is it feasible to even contemplate. However, the opportunity may present itself to link Coutada 5 (and the adjoining Coutada 4) to a future huge protected area (see below).

1.2 EXPANDING THE LIMPOPO TRANSFRONTIER PROTECTED AREA

With the recent establishment of a Transfrontier Conservation Area (TFCA), linking South Africa's Kruger National Park with the new Limpopo National Park in Mozambique and Zimbabwe's Gonarezhou National Park, the ideal was accepted by the three countries that this already huge new TFCA should eventually be extended to also include Mozambique's Banhine National Park (in Gaza) and Zinave National Park (in Inhambane). Additional areas in Zimbabwe have also been identified for future inclusion in such an expanded conservation area.

To link Banhine and Zinave with the existing Limpopo TFCA, would entail including corridors currently sparsely settled by humans, into the enlarged TFCA. Such an event would obviously open the door to also include two already-existing protected areas, namely Coutadas 4 and 5. A direct link between Kruger National Park and the Indian Ocean, more than 370 km to the northeast, would then be established. With Coutada 4 situated directly opposite Banhine National Park to the north of the Rio Save, and with the common boundary between Coutada's 4 and 5 measuring some 60 kilometres, such a possibility may indeed become more than a mere unattainable pipedream.

1.3 MANAGEMENT ACTIONS: ESTABLISHING AN EASTERN PROTECTED AREA: COUTADAS 4 AND 5 AND ZINAVE NATIONAL PARK

The management authority of Coutada 5, or more correctly the Steering Committee of AFWR, should investigate the possibility of taking the lead in motivating for the interim establishment of a public-private partnership, hopefully leading to the establishment of a formal eastern protected area in Mozambique, linking Zinave National Park with Coutadas 4 and 5 opposite the Rio Save. The eastern extremity of the proposed Limpopo TFCA could thus become operational, long before the proposed link between the current TFCA in the west and Zinave more to the east has been created. Such an eastern protected area would be about 1,7 million ha in extent, making it one of the largest protected areas in Africa.

The Government of Mozambique, in an effort to circumvent the chronic shortage of funds to establish new protected areas or to rehabilitate the existing ones, have embarked on an ambitious scheme whereby the resources of the private sector is harnessed to develop, rehabilitate and manage even National Parks, such as Gorongosa (also the Niassa Game Reserve, and the Gilé Nature Reserve). Such public-private partnerships (PPP) may, in the long-term, go far towards solving the apparent critical funding deadlock. The principle of public-private partnerships (PPP) has thus been established, with comprehensive guidelines for such partnerships being available. Coutada 5 can, by taking the lead and approaching the principals of Coutada 4 and the relevant governmental authorities, perhaps be instrumental in having a huge new protected area unit established.

Should such an event materialize, it will enhance the status of all three the areas: Zinave is currently totally underdeveloped, almost denuded of wildlife and in urgent need of rehabilitation, whilst both Coutadas 4 and 5 also needs to be rehabilitated as a matter of urgency. The establishment of such an eastern protected area, on a basis of a public-private partnership (PPP), will also enhance the chances of attracting donor funding, to assist with both the rehabilitation of the denuded wildlife resources and the concomitant development of the three areas.

Since a relatively large number of local human inhabitants, currently living in the three areas, will become involved in the event of such a consolidated area being established, innovative ways will have to be found to incorporate not only the land, but also the people living on it, into the new protected area. Though such an event will require patience and also considerable funding, it should indeed be possible to obtain the political go-ahead, and to start rectifying the mistakes of the past. The two greatest hurdles to overcome would be to successfully incorporate the local communities as partners in the venture, and secondly to raise the required funds. The Coutada 5 model, as embodied in this BBP, may serve as an example of how it could be done. The long-established principle of Community-based Natural Resources Management (CBNRM), on which extensive published literature is available, will obviously need to be harnessed.

To follow up on the possible establishment of such a public-private partnership (PPP) involving Coutadas 4 and 5, and Zinave National Park, the following steps are proposed (a formal and detailed **Operational Plan will be prepared**):

(1) To obtain the support of Coutada 4
(2) To study the relevant official policies
(3) To negotiate with the Limpopo TFCA authorities, in order to obtain firsthand insight into the proposed venture, and in the operational functioning of a PPP
(4) To instigate initial negotiations with the relevant government ministries
(5) To investigate possible sources of funding
(6) To draw up a possible framework for the PPP, based on relevant policies and Laws such as:
    a. Forest and Wildlife policy (1997)
    b. Forest and Wildlife Law (1999)
    c. Conservation policy (2009) (outlining the principle of PPP's)
    d. The characteristics of the proposed PPP, including the availability of staff
    e. Preparing a co-management framework, outlining possible rules, responsibilities, duration of agreements, funding, management structures, transparency etc
    f. To enter into official negotiations with the Government of Mozambique

Planning action: Prepare an Operational Plan to investigate the establishment of a public-private partnership

1.4 COLLABORATION AGREEMENT WITH COUTADA 4

Irrespective of whether progress is made with the proposed establishment of a formal collaborative protected unit including Zinave National Park and Coutadas 4 and 5 (which will be a lengthy process), an agreement with the neighbouring Coutada 5, whereby naturally-occurring biodiversity resources may for non-consumptive uses be pooled, may be investigated. Re-introduced and fenced wildlife species on any of the two Coutadas, will obviously remain the 'property' of the specific Coutada. Such a use agreement will have to be regulated by a formal contract, with details spelt out in appropriate implementation- or action plans.

Such an agreement may deal with the following aspects (to be formalized in an operational plan):

(1) Operating according to a common overarching Management Plan
(2) Granting mutual traversing rights, for pre-identified role-players, on pre-identified roads
(3) Granting non-consumptive use rights to each other, including wilderness trails, as identified and prescribed in an implementation plan
(4) Granting dual hunting rights under certain conditions, if approved by the Government of Mozambique, and as prescribed in an operational plan (OP)
(5) Marketing the two units as a single tourism destination, as prescribed in an OP, whilst retaining the right to provide separate bush camps and/or other tourism infrastructure
(6) Running a collaborative anti-poaching campaign
(7) Running a collaborative environmental education program, specifically aimed at the local communities
(8) Determining the extent and sources of funding

Should such an agreement materialize, a protected unit comprising almost 1,2 million hectares will be established. Such a unit could, with regards to size, be regarded as being at the very top end of protected areas in the world. Even if such a 'new' protected area could not be officially proclaimed, it will enhance the conservation status of each of the participating units, and will greatly enhance the chances of establishing a public-private partnership, including Zinave National Park on the southern side of the Rio Save, as mentioned above. It should also greatly enhance the chances, for both Coutadas, of soliciting donor aid to fund aspects such as community conservation programs, training, environmental education, and the relocation of suitable wildlife species, to mention but a few.

Planning action: Prepare an Operational Plan for the collaborative agreement

CHAPTER E2: ECOSYSTEM RESTORATION PLAN

2.1 INTRODUCTION

Whilst the conservation status of certain aspects of the biodiversity of Coutada 5 can be regarded as good, or in the case of the vegetation of the more isolated regions even near

prime, anthropogenic influences are widespread. Slash-and-burn agricultural practices left scars on the landscape, signs of illegal logging are equally widespread, some plants (such as Ilala palms) are unsustainably utilized in some localities, uncontrolled and unseasonal runaway fires have negative impacts, and lastly, and most importantly, the erstwhile abundance of a host of wildlife species have all but disappeared, or have been reduced to scattered relic populations. An ecosystem restoration plan (ERP) and action is thus imperative.

2.2 LINKAGES

The Ecosystem Restoration Plan (ERP) is not a stand-alone document and cannot be viewed or implemented in isolation. Many of the positive and negative aspects discussed elsewhere in this BBP, and all of the strategic or operational plans, are linked in some way to the restoration of the ecosystem of Coutada 5. The ERP is thus in effect a collation of some of the restoration principles and actions of all of these plans. The overall BBP is essentially a restoration plan because it deals with the rehabilitation of a protected area that has been inhabited, and altered and unfortunately neglected, by humans for a long time. All the restoration actions mentioned elsewhere in the document will not be listed again.

2.3 PURPOSE AND OBJECTIVES OF THE ECOSYSTEM RESTORATION PLAN

2.3.1 Purpose

The purpose of the Ecosystem Restoration Plan (ERP) is in line with the overall mission of Coutada 5, and is therefore compatible with the purpose and objectives of the international Convention on Biodiversity (CBD), and finally with the objectives of Coutada 5:

To plan, develop, manage and utilise Coutada 5 in such a manner that the seriously depleted biodiversity resources will be rehabilitated over time, and in line with relevant Mozambican laws and policies, thus allowing sustained consumptive and non-consumptive use of these resources, whilst at the same time pursuing sustainable agricultural developments on certain sections of the Coutada, and simultaneously acknowledging the need to involve the local communities in a positive, meaningful and mutually beneficial manner.

2.3.2 Objectives

The following objectives have been identified in order to achieve the purpose of the ERP for Coutada 5:

- To compile and implement an ERP, based on an Operational Plan(s)
- To take cognizance of, and correlate with, the variety of strategic plans mentioned elsewhere in this BBP, all of which have ecosystem restoration objectives, and would thus impact on the deployment of the ERP

- To take cognizance of, and maintain/enhance, the positive biodiversity restoration aspects that have been identified (see below)
- To address the negative biodiversity aspects and/or influences that have been identified (see below)
- To take cognizance of, and maintain/enhance, the positive social restoration aspects that have been identified (see below)
- To address the negative social aspects and/or influences that have been identified

2.4 PRINCIPLES AND POLICIES FOR THE ERP

2.4.1 The Broader Context

AFWR would not have become involved in the development and rehabilitation of Coutada 5, without an economic incentive and without the possibility of the Coutada eventually being utilized in a profitable manner. The underlying principle of the development is thus conservation through sustainable, and ultimately profitable, utilization.

AFWR's application for the Coutada 5 concession was primarily based on two objectives: firstly because of a desire to make a meaningful contribution towards the rehabilitation and development of a large and unique, but largely denuded, wildlife conservation area, and secondly to ultimately utilize the Coutada in a sustainable and profitable manner, to the benefit of all the role-players. The viability of the project would thus be directly dependent on the ability of the developers to realize these two seemingly divergent objectives.

The development and marketing of a huge African protected area such as Coutada 5, normally goes hand in hand with big game. The rehabilitation/restoration of the biodiversity of Coutada 5 has therefore been formulated as a basic principle and requirement for the development of the Coutada, and has implicitly been accepted as such by the government in drawing up a variety of national biodiversity conservation policies and laws.

With regards to the wildlife relocation program, as well as the other facets of the development of the Coutada as a multiple-use resource protected area (MURPA), AFWR accepts the basic premise of the GoM that rural developments would have to involve the local people in a fair and equitable manner. Ownership of the project would obviously, for contractual reasons, remain vested in AFWR, but benefit sharing has been built into the development at all levels. In the case of the wildlife program, benefits to the local communities would be indirect, whereas benefits accruing from the agricultural and other ventures, would be much more direct.

Given the considerable size of Coutada 5 in relation to protected areas nationally and worldwide, it stands to reason that the successful implementation of the ERP would make a huge impact locally, regionally and nationally.

2.4.2 The Biodiversity and Conservation Context

(1) General aspects

The conservation and restoration/rehabilitation of denuded large protected area such as AFWR would not normally be the function of a private company. Nature conservation is globally accepted as a responsibility of government, which should be executed as such on behalf of the people of the country. However, the GoM is currently still ill equipped to shoulder this responsibility, and are largely dependent on private companies such as AFWR to assist them in filling the gap. Even though it may be unspoken, the rehabilitation of Coutada 5 is implied in the contract that was granted to AFWR.

During the protracted civil war of the 1980's and early 1990's and in its immediate aftermath when people could move more freely, many wildlife species (especially herbivores as well as the major predators that were dependent on them) in Mozambique were decimated to the point of local extinction, or reduced to mere relics of previous populations. The southern regions of Sofala and Manica to the west, did not escape this carnage and most of the bigger herbivores and carnivores have disappeared. Only a mere handful of elephant and buffalo still roam freely. Certain erstwhile abundant herbivore species such as zebra, sable antelope, eland, blue wildebeest and Lichtenstein's hartebeest, totally disappeared, whilst relic populations of kudu, nyala, impala and smaller game still exist locally. Some hippo can still be found in the Rio Save (indications are that their number is actually increasing), with the odd lion reputedly traversing the area.

The rehabilitation of the Coutada, at least as far as the core wildlife area is concerned, will inevitably be accompanied by some stringent control measures, otherwise the past and present unsustainable harvesting of the resource will just continue unabated. These control mechanisms, such as access control and severe anti-poaching measures, will nevertheless be accompanied by community-based incentives: toe the line and conserve, and the rewards will be forthcoming (see elsewhere in this document).

(2) Mammals

The extremely precarious situation of the ungulate population of Coutada 5 has already been referred to, and the planned restoration/rehabilitation action is discussed below.

(3) Avifauna

Refer to Part B, Chapter B2 above for a brief discussion on the Avifauna. A more detailed follow-up survey will be undertaken early in 2014, after which this section, as well as possible steps to be taken to restore the avifauna component of the ecosystem, will be updated.

(4) Herpetofauna

Refer to Part B, Chapter B2 above for a brief discussion on the Herpetofauna. A more detailed follow-up survey will be undertaken early in 2014, after which this section, as well as possible steps to be taken to restore the herpetofauna component of the ecosystem, will be updated.

(5) Vegetation

Refer to Part B, Chapter B2 above, for a brief discussion on the vegetation. A more detailed follow-up survey will be undertaken early in 2014, after which this section, as well as possible steps to be taken to restore the vegetative component of the ecosystem, will be updated. Basic principles of the conservation of the vegetative component are nevertheless included in the Ecosystem Restoration Plan (ERP) below.

(6) Marine environment

As was pointed out above, no survey of the marine resources of Coutada 5 has been undertaken as yet. Probable marine conservation and restoration needs are nevertheless included in the ERP below.

(7) The agricultural environment

The negative impacts of slash-and-burn/shifting agriculture will gradually be replaced by the long-term positive impacts of conservation farming (permaculture, aquaculture or organic farming). The abandoned slash-and-burn fields in the Coutada, arising from either the resettlement of the farmers or the change-over to modern production techniques, will in time be restored by natural plant succession.

(8) Other positive conservation spin-offs

The rehabilitation of Coutada 5 will contribute to a vastly improved conservation status for the region, and will provide additional motivation for the area to be included in the proposed public-private partnership (PPP) project with Zinave National Park, and Coutada 4.

The vast majority of the current human inhabitants of Coutada 5 are still dependent for their livelihoods on what the natural environment has to offer. At full conservation-, tourism- and agricultural development, which may be 20 years down the line, upwards of 300, and even as many as 450, employment opportunities will be created. These posts would include hospitality industry staff, field rangers, field guides, administrative personnel, technical support staff, and cattle ranch assistants, to mention but a few. Such an event will not only entail a huge socio-economic benefit, but will have equally beneficial environmental impacts. Whereas in the past all these workers and their dependents had to rely on what nature could provide, they will now have a fixed income

and would have no real need nor the time and hopefully the inclination to continue with the destructive environmental practices of the past. Job creation, and the employment of modern agricultural practices, will thus lessen the impact on the environment and will indirectly contribute to the restoration of the depleted biodiversity resources of Coutada 5.

2.4.3 The Wildlife Reintroduction Context

The primary objective of the wildlife reintroduction program, is to restore the severely depleted herbivore and carnivore populations of Coutada 5. Given the general paucity of wildlife in Mozambique, including Coutada 5, and the primary objective of the Coutada system namely to serve as wildlife management or controlled hunting reserves, as well as compliance with relevant Mozambican policies, the planned wildlife restoration program for Coutada 5 cannot be questioned.

The planned wildlife rehabilitation program will have hugely positive implications as far as biodiversity is concerned, as is evidenced by the following:

- The wildlife restoration program, if successful, will be of huge conservation significance. It will be indicative of the ability and willingness of a private company to contribute materially to the restoration of Mozambique's wildlife, and as such it will play a far bigger psychological role than merely the relocation of wild animals to a denuded conservation area.
- The objectives of the herbivore re-introduction program are fully compatible with the objectives of the ERP, and largely also with international guidelines for the restoration of herbivores (although there are a few significant provisos; see the discussion below).
- The species mix and the numbers to be relocated are based on sound ecological principles: only species that historically occurred in the region have been identified for relocation and the numbers will be in line with the carrying capacity of the range. The relocation program in its entirety meets with the requirements of the relevant Mozambican authorities, as well as with all the national policies pertaining to the conservation of biodiversity
- Ownership of the re-introduced wildlife will need to be vested in the holding company (AFWR), and this valuable resource will be managed according to the principles outlined elsewhere in this BBP. (Note: the transfer of 'ownership' of the re-introduced game to AFWR, which will be unavoidable, has not been finalized as yet)
- The excellent habitat of the Coutada for wildlife species in general, but more specifically the core wildlife-wilderness area, linked to the extent of the available land, will enhance the chances of establishing a viable conservation unit
- The re-introduced wildlife, mainly elephant and buffalo, but also the smaller species, will also have a positive spin-off on the restoration of some other species, habitats or systems:

- In the absence of large herbivores, dung beetles have largely disappeared from the Coutada, and it is expected that they will either find their way back in due course, or they may be relocated.
- The hippo, currently restricted to the Rio Save, may expand their range to settle in suitable aquatic habitats of their preference in the Coutada
- Oxpeckers are also absent from the area due to the absence of hosts for ticks. These specialized birds will either be re-introduced following on the successful establishment of viable herbivore populations, or they may repopulate the Coutada from adjoining regions
- The accumulation of moribund plant material in those areas that would have been sheltered against the uncontrolled burns that occur annually, is almost as harmful as overgrazing. The bulk-grazer component of the to-be-relocated herbivore populations would, in time, and linked to an effective burning regime, be instrumental in getting rid of moribund material and in restoring the vigor of the grazing.

2.4.4 The Social Context of the ERP

The wildlife re-introduction program will probably prove to be an ecological success, notwithstanding the national paucity of wildlife to act as founder populations, and even though it may take far longer than would be ideal. However, the social impacts of the program may turn out to be more important than any ecological considerations and may jeopardize the success of the wildlife restoration action. The following social impacts, some of them positive and some negative, will thus have to be acknowledged and addressed by AFWR, otherwise the ERP, notwithstanding the good intentions, may not meet the expectations.

(1) Positive factors

Some expected positive social spin-offs from the ERP are as follows:

- Whereas very few permanent job opportunities were available in Coutada 5 at the time when the concession was granted to AFWR, more than 300 and even as many as 450 permanent jobs will be created in due course
- The agricultural scenario will change dramatically for the better, thus adding to a better life for all the role-players
- The general standard of living, not only in Coutada 5 but generally also in the district of Machanga, will increase dramatically due to the large (in local terms) amounts of money that will be in circulation.
- The Community Development Fund (CDF, see below) will be administered by the community, and will place, at full development, appreciable amounts of cash and/or products at their disposal for community projects.
- The employees of AFWR, as well as subsidiary companies to be established by private investors, and also the smallholder farmers involved in new agricultural practices, will receive in-service job training, and most of them

will thus for the first time in their lives be qualified for jobs other than their traditional livelihoods.
- Improved access to transport and thus access to otherwise out-of-reach facilities, will probably increase the levels of schooling, and health care in the outlying regions of the district

(2) Negative factors

Some early negative social impacts arising from the rehabilitation and development of Coutada 5, can be listed:

- The previous concessionaire of Coutada 5, whose contract was cancelled recently by the GoM, left a sour taste in his wake. His extremely negative standing with the official government agencies, especially local but probably also provincial, may lead to a subjective but nevertheless real distrust of AFWR amongst government officials. If such a negative perception should indeed exist, and it would be extremely difficult to determine whether it is actually the case, it may lead to subtle cold-shoulder tactics being employed towards AFWR.
- The foregoing may equally apply to some of the local people. Apparently the previous concessionaire's alleged misdeeds towards some of the local people, led, upon their lodging complaints, to the cancellation of the concession contract. The local people's experience of these misdeeds, may indeed be carried over to AFWR.
- The core wildlife area will be fenced, and will due to the presence of expensive relocated game species, as well as of some dangerous species that could cause fatal injuries to humans, be out-of-bounds to casual visitors. Some people who utilized the natural resources of the core wildlife-wilderness area in the past, may not take kindly to the perceived loss.
- The future outsourced cattle ranches will also, for obvious reasons, be out-of-bounds to vagrants or casual visitors. A similar negative perception towards Coutada 5 as a whole, may be the end result.
- These possible negative perceptions will be addressed by the public consultation and information disclosure program (PCDP) (see below)
- Resettlement of people, especially if it is not voluntary, can safely be predicted to cause discontent amongst those involved. The numbers of people to be resettled will thus have to be kept to an absolute minimum, and the resettlement action as well as the consequences thereof to the resettled people, must be dealt with in such a way that the involved families themselves actually willingly take the decision to resettle.
- The main direct benefits of the project, employment and other financial gains, will be limited to a smallish select group of people. Those who are not employed due to reasons such as that they live in remote areas, will obviously tend to be more negative about the project.

2.4.5 The Political and Administrative Context

The ERP must be viewed against AFWR's contractual obligations, whether direct with regards to specific stipulations, or indirect with regards to the implementation of Mozambican laws and policies pertaining to the conservation of biodiversity.

2.4.6 The Developmental Context

Though AFWR pledged itself to the application of sound developmental principles, as embodied in this BBP and other documents that led to the concession being granted to AFWR, the total lack of performance of the previous concessionaire may lead to an indirect negative perception as to the company's earnestness and trustworthiness. To negate such perceptions, the development of Coutada 5 will have to be transparent in all respects.

2.4.7 The Operational Context

To meet with the international requirements for a successful ecosystem restoration program, and thus to possibly qualify for donor assistance or government support, AFWR will have to ensure that scientifically acceptable principles are applied throughout the development of the project, and that relevant official policies and laws are heeded. To facilitate such a development, operational plans (OP) will have to be prepared for a host of operational actions.

2.5 MANAGEMENT OBJECTIVES, PRIORITIES AND ACTIONS FOR THE ERP

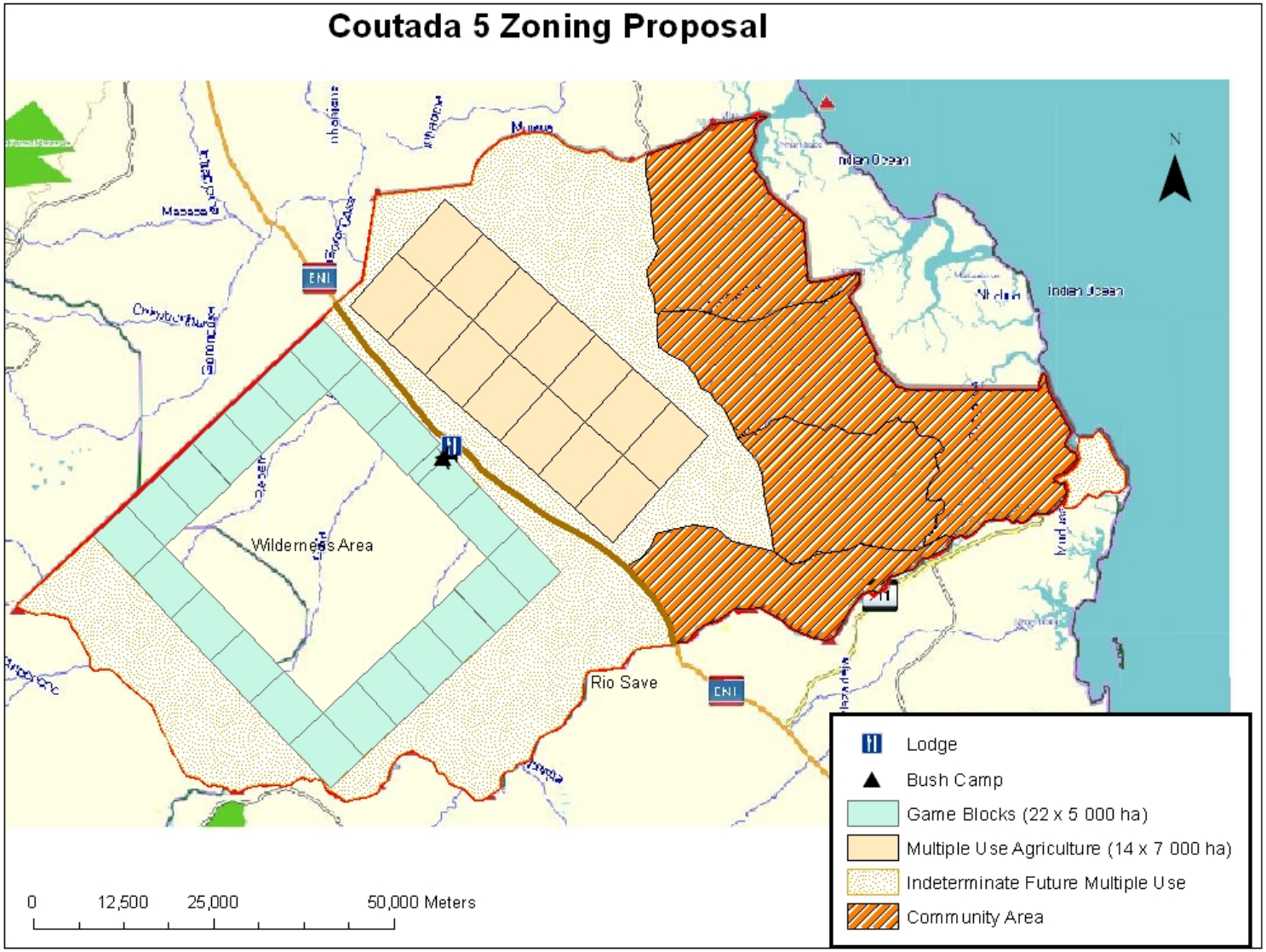
2.5.1 A 7-point procedure for implementing the ERP

A simple 7-point procedure has been devised to implement the ERP. The seven points are as follows (Refer to the OP for a detailed discussion):

Step 1: Determine linkages with other restoration-orientated sustainable plans
Step 2: Prepare an Operational Plan (OP), and draw up a schedule to implement and manage the ERP
Step 3: Provide the organizational capacity to implement the ERP
Step 4: Link the ERP to the public consultation and information disclosure plan (PCDP)
Step 5: Execute the ERP in tandem with other biodiversity and social plans
Step 6: Monitor progress with the implementation and success of the ERP
Step 7: Establish report back procedures to report on progress/problems

Planning action: Prepare an OP for the ERP

PART F: ZONING PLAN AND INTEGRATED COASTAL AREA MANAGEMENT: COUTADA 5


Coutada 5 Zoning Proposal
Indian Ocean
Indian Ocean
N
EN1
EN1
Wilderness Area
Rio Save
0
12,500
25,000
50,000 Meters
Lodge
Bush Camp
Game Blocks (22 x 5 000 ha)
Multiple Use Agriculture (14 x 7 000 ha)
Indeterminate Future Multiple Use
Community Area

CHAPTER F1: ZONING

1.1 THE ZONING PROCESS

The zoning plan for a protected area establishes the framework for management, and is normally the primary document from which the management plan is derived. Zoning should apply to all activities occurring within a protected area, and should appear in the management plan to guide the way in which the area is managed. Most national park services, and conservation agencies, adhere to a strict zoning regime and use zoning firstly as a framework for specific planning, and secondly to facilitate management decisions on the use and development of their protected areas.

The main objectives of a zoning plan, as it pertains to Coutada 5, could be summarized as follows:

(3) To provide protection for critical or representative habitats, ecosystems and ecological processes (such as wetlands, unique vegetation communities, and possibly the coastal mangroves and salt marshes);
(4) To spatially separate possibly conflicting human activities (such as ecotourism activities and cattle ranching);
(5) To protect the natural and/or cultural qualities of the protected area while allowing a spectrum of reasonable human uses (as embodied in the principle of a multiple-use resource protected area or MURPA);
(6) To reserve suitable areas for particular human uses (such as hunting blocks), while minimizing the effects of these uses on the protected area; and
(7) To preserve some areas of the protected area in their natural state, undisturbed by humans (especially in a large area, as is the case with Coutada 5, this is not only feasible but also highly desirable; the planned wilderness area of about 100 000 ha within the system of 22 wildlife blocks, falls into this category).

1.2 ZONE CLASSES

Many first-world conservation agencies have adapted universal zoning systems to suit their own needs, but in all instances the same basic principles are applied in order to meet the above zoning objectives. In the case of Coutada 5, the zoning plan will adhere to these principles. In any protected area that is accessible to man, such as Coutada 5, a visitor risk management program need to be drawn up.

The United States National Park Service (USNPS) apply a simple zoning category system based on four zones:

Natural Zone: Managed to conserve natural resources and ecological processes, with visitor uses restricted to ways that would not adversely affect these resources and processes.

Cultural Zone: Managed for the preservation, protection and interpretation of cultural resources. Development must be compatible with the preservation and interpretation of these cultural values.
Development Zone: Managed to provide and maintain facilities serving the visitors and the park managers.
Special Use Zone: Managed for specialized uses.
(Obviously, no agricultural zones are identified, as would be the case for Coutada 5)

To augment and refine this very broad system, the USNPS developed a detailed visitor management framework (the Visitor Experience and Resource Protection framework or VERP) to determine visitor carrying capacity in terms of the quality of the resources, and the quality of the visitor experience. This multi-disciplinary approach provides guidelines to determine and measure Limits of Acceptable Change (LAC) and Visitor Impact Management (VIM), and entails a detailed monitoring plan to determine the effectiveness of the zoning system.

Other systems similar to the VERP system, include the Visitor Activity Management Process (VAMP) developed by Parks Canada and the detailed Recreation Opportunity Spectrum (ROS) model of the US Forest Service and Bureau of Land Management. All these visitor risk management programs were developed to allow the respective agencies to identify, analyze and control the broad range of visitor induced risks that may threaten the ability of a protected area to achieve its objectives. These programs are thus at the heart of the zoning process, and are as such directly applicable to Coutada 5. (See discussion below)

1.3 ZONING OF COUTADA 5

The Parks Canada zoning system is regarded as easy to understand and easy to implement. The zoning system for Coutada 5 is based on the Parks Canada system, linked to the VERT visitor management model:

1.3.1 Introduction to the zoning system for Coutada 5: Terrestrial environment

The Parks Canada classification allows for the following zone classes:

I	Special Preservation
II	Wilderness
III	Natural Environment
IV	Recreation
V	Parks (Coutada) Services: official and private

Since Coutada 5 will of necessity be developed as a MURPA, with multiple uses, including agricultural ventures, being allowed, the local zoning system include the following additional classes (classes that are not normally associated with the development of a protected area):

VI	Agriculture: extensive livestock ranching: investors
VII	Agriculture: extensive livestock ranching: local entrepreneurs
VIII	Agriculture: intensive smallholder farming
IX	Agriculture: indeterminate future irrigation area(s)
X	Towns/settlements

All of these classes, with some doubts with regards to the viability for zone class IX areas, will provisionally be used for the zoning of Coutada 5 (see below). It must be stressed, however, that the following zoning plan should be regarded as an interim measure and that an OP will need to be compiled to develop the plan in more detail.

It is a universally accepted principle that once a protected area (or a MURPA, such as Coutada 5) has been zoned, changes to the zones will only be considered if conclusive arguments in favour of the change could be advanced. In the case of Coutada 5 any changes will have to be based on an in-depth assessment of the reasons, and in this regard a motivation by the Management Committee must be approved by the Steering Committee. However, this proviso will not be stringently applied with regards to the exact demarcation of the various community development areas (zone classes VII, VIII and IX, see below), to allow for future expansions of the settled/farmed areas. To allow for such an eventuality, uncharted buffer zones have been included in the community development zones.

1.3.2 Coutada 5 terrestrial zone classes

The following terrestrial zones were provisionally identified (see map):

Zone Class I: Special preservation

Zone purpose

A Special Preservation zone denotes a specific area or feature that deserves special preservation because it contains or support unique, rare or endangered features or the best examples of such features.

Boundary criteria

There are no specific boundary criteria for such areas. The extent of Special Preservation areas are determined by on-site ecological-, protection-, practical- and aesthetical considerations.

Management framework

Only strictly controlled and non-motorized access will be allowed to these areas. Any existing roads traversing such areas, will be rerouted. Management interventions will be restricted to the prevention of any anthropogenic degradation. Due to the generally small size of these areas, each area will be individually identified and demarcated, and briefly described, in an appropriate OP.

Implications for Coutada 5

A number of Special Preservation areas have provisionally been identified for Coutada 5. As AFWR's knowledge of the Coutada improves, it is possible that more Class I Special Preservation areas will be identified and managed as such.

Planning action: Prepare an operational plan demarcating and describing the Class I special preservation areas

Zone Class II: Wilderness

Zone purpose: The purpose of the wilderness zone is to preserve and maintain the identified area in a wilderness state.

Boundary criteria: The international criteria for designation of a wilderness area is 2 000 ha and greater. The designated wilderness area for Coutada 5 has not been accurately surveyed, but at approximately 100 000 ha it easily exceeds this requirement. It is possible that smaller wilderness units may in time be identified and zoned as such.

Management framework: Due to the large sixe of the planned wilderness area, it is envisaged that the block will be divided in four units of almost equal size, viz 25 000 ha each. A grid of two bisecting roads will provide access to the block. Management will be aimed at preserving the natural environment setting. Internal access, off the two bisecting roads, will be by non-motorized means only, whilst activities consistent with resource preservation will be allowed. The hunting camps will be sited on the outside border of the wilderness block. Any structural developments necessitating vehicular access, or provision of the facility, or maintenance of the structure by vehicle, will also be restricted to the outer boundary of the area. However, should large game be hunted in such an area, whilst the hunting will take place on foot, the removal of the carcass will necessitate vehicular access to the locality where the animal was hunted.

Implications for Coutada 5: The primary designated wilderness area is situated in the core wildlife-wilderness area. This area is thus not identified or zoned for any development, barring low-intensity wilderness type hunting camps, hunting on foot and traversing of the two-road grid system by hunters and game block investors.

Planning action: Prepare an operational plan demarcating and describing the Class II wilderness area

Zone Class III: Natural Environment

Zone purpose: Areas that will be maintained as natural environments, and which can sustain a minimum of low-density outdoor activities with a minimum of related activities and physical developments

Boundary criteria: The extent of the natural environment providing outdoor opportunities; in the case of Coutada 5 this relates to the 22 game blocks of the core wildlife-wilderness area (the so-called hunting blocks,)as well as subordinate natural areas that will not be developed in the near future

Management framework: Internal access will be by non-motorized and limited motorized means. Structural developments, including tourist and investor's accommodation, will be restricted to rustic, small-scale, permanent, fixed-roof structures for investor use and/or visitor use and/or operational use. Camping and bush camp facilities, if any, will fit in with this theme and will be rustic or semi-primitive. The term 'rustic' includes 'upmarket' rustic facilities, as against 'primitive'. The accent will thus be on 'natural', rather than ostentatious.

Implications for Coutada 5: The major portion of the area to the west of the EN1 has been zoned as the wildlife-wilderness block, with the 22 hunting/game blocks constituting the Zone Class III Natural Environment, with only very limited development being allowed. Some areas to the east of the EN1 may in future, depending on especially agricultural developments, also be zoned as Class III Natural environments.

Zone Class IV: Recreation

Zone purpose: These are clearly defined areas of limited extent, which can accommodate the planned range of outdoor recreation opportunities and related facilities in such a way that the natural landscape is respected. These to-be-designated areas in Coutada 5 are not mapped.

Boundary criteria: The extent of outdoor opportunities and facilities and their area of immediate impact.

Management framework: Management would be oriented to minimizing the impact of activities and facilities on the natural landscape. Tourist facilities will be of the basic serviced kind, and small and decentralized accommodation facilities would be allowed.

Implications for Coutada 5: The development philosophy of Coutada 5 is such that very limited Zone IV recreation would need to be accommodated. No such terrestrial areas are currently indicated on the map, but may eventually include facilities such as bird viewing hides, picnic points along the tourist roads etc. Any development would be subject to the preparation of an OP.

Planning action: Prepare an OP for each future Class IV area

Zone Class V: Coutada Services: official and private

Zone purpose: This zone would accommodate all the areas with a high concentration of visitor services (such as the AFWR camps, management support services, administration functions, and the staff village/accommodation. Agricultural facilities of a similar nature, are dealt with in Zone Class IX (see below)

Boundary criteria: The extent of the services and facilities and their immediate areas of impact.

Management framework: Management would be oriented to emphasizing the Coutada 5 setting and values, with regards to the location, design and operation of the visitor support services, Coutada administration and operations functions. Access will be by motorized and non-motorized means, and the activities and services have been centralized as much as possible.

Implications for Coutada 5:
The very limited extent of these services with regards to surface area means that any negative impacts will be localized. The development ethos of AFWR is also such that only environmentally friendly practices will be allowed. In comparison to other Coutadas in Mozambique, where development seem to be either minimal or at a relatively low level, Coutada 5 has embarked on an expensive and ambitious development program.

Zone Class VI: Extensive livestock ranching: investors

Zone purpose: To accommodate the planned extensive livestock ranching enterprises

Boundary criteria: The selected area is large enough to make provision for 20 livestock ranches of 5 000 ha each

Management framework: The livestock ranching area, to the east of the EN1, will be developed and managed by investors (probably mostly foreign), on a sub contractual basis (DUAT) with AFWR, and according to strict rules as outlined by AFWR in an appropriate OP.

Implications for Coutada 5: AFWR has no choice but to set aside, and market, suitably large areas for livestock ranching. These ranches will be outsourced on a contractual basis. These areas are all situated to the east of the EN1, and will generate funds that will be allocated to the development and rehabilitation of the core wildlife-wilderness area, to the west of the EN1

Planning action: prepare an OP for the development of specific areas for livestock ranching purposes by investors

Zone Class VII: Extensive livestock ranching: local entrepreneurs

Zone purpose: To accommodate the current livestock ranching enterprises, operated by local entrepreneurs, to the northwest of Machanga

Boundary criteria: The exact boundary (especially to the west of the zoned area) will be determined by AFWR, in consultation with the entrepreneurs. The area will probably border on Zone Class VI to the west.

Management framework: The livestock farmers currently operating in the open dambo areas to the northwest to the town of Machanga, will probably be allowed to operate, even though the area may floristically speaking be regarded as unique. To try and prohibit them from continuing with their practices, will cause a tremendous amount of ill-feeling, which AFWR cannot afford. These entrepreneurs will be assisted by AFWR with technical advice, in order to ensure that the minimum of negative environmental impacts arise from the ventures. One or more farmer's unions will need to be established.

Implications for Coutada 5: AFWR will determine if the full system of dambos (open grasslands; seasonally flooded) is utilized by the local entrepreneurs; if not, the remaining area may be zoned as a Class 1 Special Preservation area. The internationally endangered wattle crane was observed in this area in 2002.

Planning action: prepare an OP for the development of specific areas for livestock ranching purposes by local entrepreneurs

Zone Class VIII: Intensive smallholder farming

Zone purpose: To set aside a suitable area to be developed for intensive family-based farming practices on smallholdings

Boundary criteria: The areas around Machanga, at suitable localities along the bank of the Rio Save, and at some localities along the EN1 where it would be not feasible to resettle the current occupiers, are zoned to be developed as intensive family-based farming ventures

Management framework: One or more farmer's unions will need to be established. Outside assistance by NGO's and/or governmental agencies will need to be solicited.

Implications for Coutada 5: AFWR will actively support these ventures. Assistance from outside sources, such as NGO's and governmental agencies, will need to be solicited otherwise the venture may prove to become an economic liability for AFWR.

Planning action: prepare an OP for the development of specific areas for intensive smallholder agricultural ventures

Zone Class IX: Agriculture: indeterminate future irrigation area(s)

Zone purpose: This zone has not been identified yet. Should it be established at a later date, it will be used for the production of irrigated crops.

Boundary criteria: The to-be-confirmed area will be restricted to those areas that have already been earmarked as zone class VI.

Management framework: Should such a zone be established, it is likely that the ventures will be outsourced by AFWR on a sub-contractual basis. Suitable soils for these ventures will have to be identified.

Implications for Coutada 5: AFWR may generate funds from outsourcing such ventures, and such zoning may thus result in funds being generated for the development of the core wildlife area.

Planning action: depending on demand, prepare an OP for the development of specific areas for irrigation ventures

Zone Class X: Towns/settlements and development nodes

Zone purpose: The currently settled localities, such as the towns of Machanga, Jofane and Divinhe, fall into this zone

Boundary criteria: The existing boundaries of the settled area serve as the boundaries for the zones, with provision for future increases in existing human populations, or for possible immigration into the area

Management framework: The development and management of existing settled areas such as towns, will be a function of the GoM. AFWR may only become involved in an advisory capacity, for example with regards to smallholder agricultural ventures on suitable land.

Implications for Coutada 5: AFWR accepts the fact that these settled areas are part and parcel of the current and future Coutada 5 set-up.

1.4 DEVELOPMENT PLANS

AFWR will prepare node development plans (NDP, including technical drawings) and site development plans (SDP; including technical drawings), as a matter of routine, for all physical structures or facilities that will be built in Coutada 5, excluding the construction of facilities, houses and structures to be erected by the local people in zone class X. The official governmental institutions will ultimately be responsible for such developments.

1.5 DEVELOPMENT RISK MANAGEMENT

The zoning plan need to achieve the zoning objectives as outlined above, otherwise there would be no sense in zoning the Coutada. With the zoning plan serving as a baseline for

management, a framework to determine the limits of acceptable change (LAC) due to visitor impacts and development, specifically as it impacts on the core wildlife area, needs to be put in place.

The management implications of the tourism development of Coutada 5, inclusive of the private developments in the core wildlife area (zone classes I, II, III, IV and V), as well as the agricultural developments, are dealt with elsewhere in this BBP. The following summary of a LAC process for Coutada 5, must therefore be considered in conjunction with the tourism development plan:

- The LAC process focuses on determining the desirable (or allowable) environmental and social conditions for the specific visitor activity, inclusive of subcontracted private sector developments.
- The process as it will be applied to Coutada 5, involves the following steps in general, but also for each activity:
  - Identify special values, issues and concerns
  - Identify and describe recreation opportunity zones
  - Select indicators of resource and social conditions
  - Inventory the existing resource and social conditions
  - Specify the standards for resource and social conditions in each of the opportunity classes
  - Identify alternative opportunity class allocations
  - Identify management actions for each alternative
  - Evaluation and selection of a preferred alternative
  - Implement actions and monitor conditions

The diligent implementation of the LAC process will provide valuable insights as to the applicability of the zoning plan. Obviously, the impacts of existing developments (official government roads, towns etc) will not be included. It is important to recognize the following challenges that may arise from the implementation of the LAC process:

- It will require funding, time and staff inputs
- Some vital information about visitor-related impacts may be lacking, and will necessitate subjective assessments
- Even when limits are exceeded, appropriate management action may still not be taken due to a lack of resources, or an unwillingness or inability to take unpopular decisions.

1.6 ZONING OPERATIONAL PLAN

Rather than preparing one OP for the zoning process, and the implementation thereof, various OP's will need to be compiled, as indicated above.

CHAPTER F2: INTEGRATED COASTAL AREA MANAGEMENT

2.1 BACKGROUND

Whilst responsibility for coastal area management do not seem to fully apply to Coutada 5 (because the Coutada may only involve terrestrial natural resources; the matter has not been resolved yet), the Coutada do have a coastline of some 30 km in length. The littoral zone stretches from the high water mark to the level of permanently submerged areas, and thus includes the intertidal zone. In the case of Coutada 5, extensive mangrove swamps and salt lakes are included in the littoral zone. The littoral zone may therefore be regarded as part terrestrial, part marine, and as such probably falls within the ambit of Coutada 5's conservation mandate. It would thus seem as if an Integrated Coastal Area Management process (ICAM), even if only on a relatively low scale, will have to be considered. ICAM is an internationally recognized method that focuses not only on the protection and management of specific natural components of a coastal area, but that considers the broader coastal zone.

2.2 INTEGRATED COASTAL AREA MANAGEMENT FOR COUTADA 5

ICAM procedures will have to be applied to the management of the coastal zone by AFWR, albeit at a non-intensive level, and subject to progress with other more urgent conservation and management priorities.

The ICAM procedures, as applied at Coutada 5, will, where feasible, be in line with national and regional policies, and will closely involve all the relevant official bodies prior to any actions being undertaken. The long-standing use of marine resources by the local people will not be questioned, but if any non-sustainable activities should be identified, as will probably be the case, AFWR should take the lead in assisting the formal institutions in trying to combat such practices. For example, it has been mentioned (but not verified) that the harvesting of prawn species along the coast of the Coutada, has already taken on non-sustainable levels.

If a formal ICAM process could be established with the Government of Mozambique playing a prominent role, the following 'golden rules' for coastal management may be applied and/or realised:

- Equitable use of the resources may be achieved
- Such use will be sustainable
- The level of impacts could be minimized
- All stakeholders could become involved
- Adequate funding (donor aid?) will become available
- The process will be viewed as long-term
- Effective communication involving all stakeholders will be imperative

The implementation of a successful ICAM procedure for Coutada 5 would be dependent on the following prerequisites being met:

- Set achievable objectives progressively
- Identify the problems

- Set goals and timetables co-operatively
- Gain integrated support for all policies and plans
- Achieve top-down and bottom-up involvement
- Policies and goals must be aimed at sustainability
- Undertake cost-benefit analyses
- Undertake monitoring and review

However, the most important prerequisite from a AFWR perspective, would be to enlist the direct support of appropriate local government institutions, to ensure that the appropriate laws and regulations are enforced. AFWR should under no circumstances become directly involved with law enforcement pertaining to either the coastal area or marine resources.

Planning action: Prepare an Operational Plan

PART G: SOCIAL IMPACT ASSESSMENT: COUTADA 5

GENERAL NOTE

A full Social Impact Assessment (SIA), undertaken in-house by AFWR, is currently (August 2013) underway. The survey concentrates on the households that are living in the planned core wildlife-wilderness zone, and that may have to be resettled elsewhere. The following discussions are therefore not fully based on empirical data, and should be regarded as provisional. This Part of the BBP will thus be updated in early 2014. Certain sections, especially those that build on principles and do not rely on empirical data such as the Resettlement Action Plan, will in the meantime be implemented.

CHAPTER G1: LINKAGES BETWEEN BIODIVERSITY AND SOCIAL IMPACTS

The preparation of biodiversity-based management plans for unpopulated protected areas normally deals largely with biodiversity resources as a first priority, with only secondary attention paid to peripheral (but nevertheless often important) aspects such as tourism developments. It is rare indeed for the planners of a protected area to be concerned with for example wide-ranging agricultural ventures and especially the involuntary resettlement of people.

In the case of Coutada 5, however, the outlying regions of the protected area are sparsely populated by humans, at least some of whom have been living there for a number of years. The local inhabitants are therefore as much part of the planning process and development scene as the biodiversity of the Coutada. The rights, aspirations and needs of those inhabitants are indeed even more important than any other factor in the planning process. It would be senseless, for example, to plan for the establishment of special protected areas and to combat the bush meat menace, without having the local people on board.

Community affairs thus figure prominently in this BBP: firstly a comprehensive social impact assessment has been launched, and the incomplete data lead to the formulation of a number of social action plans (as discussed below).

CHAPTER G2: LAND-USE RIGHTS OF LOCAL COMMUNITIES IN COUTADA 5

The historical fact of various long-established communities living in Coutada 5 is acknowledged. These communities include the major town of Machanga, as well as smaller communities at for example Jovane and Divinhe. The development and management of Coutada 5 will not in any way interfere with the existence of such communities, except to ensure that they are kept abreast of any developments, especially those that may impact on their daily lives, however remotely.

However, an unknown number of families have recently settled ‘illegally’ in some of the more remote regions of the Coutada. Where such settlements took place in the areas zoned for community use obviously no immediate remedial steps will be taken, except to try and get these people to voluntarily become involved in the socio-economic upliftment ventures emanating from the social action plans. Even though the families involved with the bush meat trade operate

illegally and may indeed be prosecuted, every effort will be taken to ensure that their vested rights according to international and Mozambican laws and policies will be respected. These aspects are dealt with in the Resettlement Action Plan (RAP) discussed below.

CHAPTER G3: SOCIAL IMPACT ASSESSMENT: COUTADA 5

3.1 PURPOSE

Since the rehabilitation and development of Coutada 5 will impact on people, it stands to reason that these impacts will have to be quantified. An assessment of such impacts will be based on having baseline knowledge of the social parameters at play. The relationship between the AFWR development, the people involved and both the social and natural environments must thus be managed with great care. A full Social Impact Assessment (SIA) was thus launched, but is incomplete at the time of writing this BBP (August 2013).

3.2 THE SOCIAL IMPACT ASSESSMENT PROCESS

The still incomplete social impact assessment process was undertaken in-house, primarily to save time.

3.2.1 IFC/World Bank Guidelines

The tried and tested social impact assessment guidelines of the World Bank played a major role in the SIA process for Coutada 5.

3.2.1.1 Environmental Assessment

The development requirements for a Coutada in Mozambique (an official protected area) fall short of mandating a full Environmental Impact Assessment (EIA). However, all the relevant prescriptions were adhered to.

3.2.1.2 Cultural property

The Coutada 5 project will in no way damage or harm non-replicable cultural property, although access to land that may have cultural value may inadvertently be restricted. No complaints were received in this regard.

3.2.1.3 Indigenous People

The project will have no negative impacts on any ethnic minorities, but there may be impacts on other minority social groups such as women or other marginalized groups, who may not be consulted by the decision makers in the communities on matters that may impact on them. AFWR would just have to accept such an unavoidable eventuality.

3.2.1.4 Involuntary Resettlement

The policy for Involuntary Resettlement as prescribed by the IFC/World Bank and as applied by AFWR, ensures that the population displaced by the project receives benefits to compensate them for any usufruct or customary rights that they may have lost. This all-inclusive policy ensures that all the directly and indirectly affected people are

compensated. It is recognized by AFWR that the absence of legal title does not limit the affected people's rights to compensation. It is furthermore recognized that people may lose the rights to use resources without actually losing possession of them, and that such loss is also defined as involuntary resettlement. The IFC's handbook for Preparing a Resettlement Action Plan also specifies guidelines that were applied by AFWR.

3.2.2 Mozambican social assessment and resettlement recommendations

Many Mozambican laws and policies provide for the active involvement of local people during the execution of projects involved with environmental matters, especially where the displacement of people may be inevitable. National standards for such a community or public involvement are prescriptive, and are mostly in line with international recommendations in this regard. Participatory planning, as is practiced by AFWR, ensures that all aspects such as population growth, provision of services and the future generation of income opportunities are adhered to.

3.2.3 Methodology for the SIA survey

A full socio-economic baseline survey and SIA are currently (August 2013) being undertaken by AFWR. At this early stage of project development obviously only those households who are to be directly impacted, are concentrated on. The large number of people living in the towns and major settlements will not be surveyed, because any impacts on these households, such as assistance with the implementation of improved agricultural techniques, should be regarded as a project-induced positive. Thus only households who may be physically or economically displaced are included. Both a qualitative (social dynamics, decision making and leadership, livelihood strategies, the impacts of the project as experienced by the affected people, opportunities for the social rehabilitation of resettled families and community development activities), and quantitative assessment (using comprehensive questionnaires) are being undertaken.

The following procedure leading up to the SIA survey was applied, or is in some instances in the process of application:

(2) Uncertainties with regards to the exact location of the northwestern boundary of Coutada 5 were first sorted out, to determine the location of the zoned wildlife relocation-cum-wilderness block (completed)
(3) This block of some 220 000 ha will then be flown by using a grid system. A small spotter plane will be used. During this aerial survey it will be endeavored to determine the exact GPS point of each homestead or settlement occurring within the planned wildlife-wilderness block. (incomplete)
(4) During the aerial survey all discernible roads and well-used footpaths will be plotted as accurately as possible.(incomplete)
(5) Following the aerial survey, all the waypoints determined during the flights will be visited on the ground to confirm the exact locality. All known or accessible roads will be traveled, and mapped. No SIA survey will be undertaken at the time, because the objective of the exercise is mapping and not a social assessment. (incomplete)

(6) In the interim a baseline social study questionnaire was prepared, and the direct assistance of the local government institutions was enlisted to ensure that the survey was impartial and fair to the people surveyed. (incomplete)
(7) Once the abovementioned baseline data becomes available, it will be determined which families living in sensitive areas, or within the predetermined and zone wildlife-wilderness blocks, will have to be resettled.
(8) An assessment team consisting of two persons will then visit each of the affected families, and undertake a SIA. The SIA will be augmented by photographs, where appropriate. A relatively comprehensive questionnaire, based on international examples of such questionnaires, will form the basis for these surveys.
(9) Any traditional leaders who may have been involved with families to be resettled to other areas, were consulted
(10) During a subsequent desk assessment of the results of the SIA, compensation for each class of to-be-resettled family will be determined. Obviously, the amount of the resettlement compensation will be directly determined by the extent of the family's assets that will be affected by the resettlement.
(11) Each to-be-resettled family will then be visited at least once, in the company of a nominated government official, to negotiate the settlement offer to the satisfaction of both AFWR and the to-be-resettled family
(12) In addition to cash compensation, each to-be-resettled family will receive household goods and, where appropriate, certain farming equipment.
(13) Prior to any actual resettlement taking place, consultation with the local traditional leader of the resettlement area (the host population) will determine the exact locations of where these families would be resettled to. These areas will then be negotiated with the to-be-resettled families.

3.2.4 Public consultation

The public consultation process as it relates to the SIA, and the following resettlement of some households, are not complete as yet (August 2013). During the consultation process (see below) the aims and objectives, as well as the impacts, of the social assessments and the pending resettlement actions, will be discussed with the local people. No resettlement will be undertaken unless the action has been discussed and the uncertainties resolved.

3.3 SURVEY LIMITATIONS

In order to proceed with the detailed planning of urgent programs such as the wildlife relocation project, and in general also the much needed rehabilitation of Coutada 5, exhaustive information had to be obtained with regards to the estimated social impacts of such projects. The ideal would have been to contract specialist sociologists to manage such surveys, but time constraints (and to a lesser extent also financial considerations) necessitated that the SIA's be planned and undertaken in-house.

The two-person survey team consists of one Mozambican and possibly one South African, both fully conversant with the aims and objectives of AFWR. The questionnaire was prepared by the editor of this BBP, and was based on existing examples used during other

similar surveys. Notwithstanding the fact that every precaution was taken to be as objective and fair as possible, some subjectivity on the side of the survey team was thus inevitable. The probable existence of this limitation is acknowledged, though AFWR is of the opinion that the end result is fair to all concerned.

CHAPTER G4: SOCIAL IMPACT ASSESSMENT BACKGROUND AND DESCRIPTION: COUTADA 5

4.1 SOCIAL INDICATORS

In a very poor country, with Mozambique ranking amongst the poorest nations in the world despite positive growth for the last more than 15 years, the human development rank for Sofala and more specifically Coutada 5, may be as low as 184th out of 187 nations. The socio-economic figures for Coutada 5 were not researched, but the following current data for Mozambique illustrates the severity of the problem (bearing in mind that the local communities in the undeveloped regions of Coutada 5 will probably be even below the national average in most instances):

- The per capita GDP is US $800
- The GNI per capita (Atlas method) is US $480 (compared to US $1,285 for Sub-Saharan Africa)
- The infant mortality is 142 per thousand births
- The life expectancy is 50,2 years
- The literacy rate is 55,1%
- 44,1% of households have no access to safe water

4.2 SOFALA'S PROVINCIAL DEVELOPMENT STRATEGY

In a poor country such as Mozambique, the national and provincial development strategies reflect the urgent need for socio-economic upliftment. Virtually all government policies therefore centre on addressing shortcomings and/or problems such as the following:

- Preventing migration of male household heads to areas where a better income may be realized, thus leaving a high number of female-headed households.
- Addressing low literacy levels, especially amongst females
- Providing access to potable water
- Increase the availability of agricultural extension services
- Improve economic initiatives
- Address those socio-cultural factors that encourage the youth to seek employment elsewhere
- Encourage private sector initiatives to assist in achieving economic growth
- Encourage the participation of and benefits to communities in the protection and sustainable management and use of renewable natural resources

The social objectives of the development of Coutada 5 are fully in line with these national and provincial development strategies.

4.3 SOCIAL OBLIGATIONS

A perusal of the objectives of Coutada 5, as elucidated above, clearly illustrates AFWR's intent to contribute to the socio-economic upliftment of the local communities. In this respect a number of company policies have been formulated, including the concepts of co-management, establishing community liaison structures and employing the system of community-based natural resources management wherever feasible.

4.4 SOCIAL EFFECTS OF THE FENCING AND GAME RE-INTRODUCTION SCHEDULE

The necessity to extensively rehabilitate Coutada 5 is an unavoidable fact that was recognized by AFWR right from the onset of the project. The name of the company includes the descriptive words '*wildlife restoration*', and embodies the intention of AFWR to revitalize and rejuvenate the Coutada to its erstwhile glory. This will entail the investment of appreciable capital resources.

The severely depleted wildlife resources of Coutada 5 necessitated the formulation of an extensive and expensive wildlife re-introduction program. Since the whole area has been stripped of the game herds that used to roam freely in large numbers, any re-introduction program will have to ensure that expensive and scarce species must, after release, be effectively contained. There is only one way of achieving this, and that is to erect a very expensive game-proof fence around the core wildlife-wilderness area. An area of some 210 000 ha to the west of the EN1 has been identified for this purpose (refer to the zoning map), making it one of the largest fenced protected areas in the world, and probably the largest in private ownership.

However, an inevitable result of such a fence is that whilst it will, as planned, restrict the free movement of game species, it will also restrict the ingress and egress of people to the fenced area. It is the intention of AFWR to repopulate the core wildlife-wilderness area as far as possible with those species that used to populate the area in the days when free-ranging herds still occurred. These species include dangerous big game such as elephant, buffalo and lion, and will thus rule out the free passage of people on foot or on bicycle through the area. Since most of the western region of Coutada 5 (to the west of the EN1) has been zoned as the core wildlife-wilderness area and will thus need to be fenced, an unfortunate result is that the main access road to the communities living along the Rio Save will eventually be fenced off at either end. This road stretches for a distance of some 60 km from the EN1 to the Rio Save.

The impacts of this development will need to be discussed with the communities involved, or at least with the formal community structures that will be established. Since the lack of reliable (and affordable) transport to and from these communities has been a major stumbling block for a long time, the fencing off of the road may prove to be a blessing in disguise to the people using the road: AFWR plans to establish a ferry system that will provide free transport through the wildlife-wilderness area twice a day in either direction. Unaccompanied motorized thoroughfare, for example to civil servants, will still

be allowed. An alternative would be to reroute the road further to the south, in order to skirt the wildlife-wilderness block.

4.5 RESETTLEMENT

As has been pointed out elsewhere, some people living in the core wildlife-wilderness area will inevitably have to be resettled. Economic displacement also comes into play.

4.6 COMMUNITY DEVELOPMENT

Various community development initiatives will (or has) been launched. These initiatives are dealt with elsewhere in this document.

4.7 KEY SOCIAL STRATEGIES GUIDING FUTURE DEVELOPMENT

Three key strategies define the model for community development in Coutada 5:

- Strategy 1: To establish the required community structures, including a community trust, in order to facilitate the principles of co-management and community-based natural resources management
- Strategy 2: To implement an effective Public Consultation and Disclosure Plan (PCDP) in order to not only keep the communities informed, but also to facilitate a positive relationship between Coutada 5 and the people of the area.
- Strategy 3: To implement a system of agricultural reform whereby the outdated slash-and-burn technique is gradually replaced by modern smallholder production techniques.

CHAPTER G5: THE EXISTING SOCIAL AND ECONOMIC SITUATION: COUTADA 5

5.1 HISTORICAL BACKGROUND

A comprehensive overview of the history of Coutada 5, which would have been time consuming to research, was not compiled by AFWR. Since the existence of Coutada 5 as a declared protected area is a given fact (the Coutada was gazetted in 1972), historical facts are of little importance, *except insofar as the effects of some historical developments, such as the uncontrolled influx of people to the rural reaches of the protected area, influence current development and management*. These realities must be considered and, where possible, turned around.

5.2 INSTITUTIONAL STRUCTURES

This data was not available at the time of writing of this first iteration of the BBP. The BBP-document will be updated early in 2014

5.3 CULTURAL HERITAGE

This data was not available at the time of writing of this first iteration of the BBP. The BBP-document will be updated early in 2014

5.4 COMMUNITY RESOURCES

5.4.1 Background

This section deals with those resources that occur outside of the commonly-accepted boundaries of the major settlements, thus includes only those communities, especially to the west of the EN1, who are more directly influenced by the development of the Coutada.

5.4.2 Spatial organization and land use

Normally, land use and the spatial distribution of domestic groups are based on the lineage and marriage relationships at the household level. The people's homes are thus not only physical sites with structures, but are often representing the value system that defines the relationship of the people to each other and to the natural resources of the area. In the long-settled areas of Coutada 5, such as the towns, this phenomenon applies locally. However, when the Mozambican Coutadas were originally proclaimed it seems as if most of them were either not settled by people, or very sparsely settled at best.

Dispersed settlement of unoccupied areas ensures access to and use of geographically dispersed resources over time. The areas of the sites occupied by new settlers directly depend on the household size, the local topography and also the suitability of the soils and other resources. Each family obviously makes an effort to control sufficient space to guarantee their survival.

In certain Coutadas, such as Coutada 5, the collapse of civil order during the long-drawn-out civil war of the 1980's and early 1990's, and also after the cessation of hostilities in the early 1990's, led to an uncontrolled influx of people to some areas. Coutada 5 is thus today settled by many more people than was the case in for example 1980 or 1990, and the influx to land regarded by people as 'vacant' land seems to continue unabated and may even be accelerating. The number of especially illegal hunting camps that sprung up all over the Coutada in recent times, is a major cause for concern. The 'hunters' do not only hunt in order to feed their families, but are actively involved with the so-called bush meat trade, supplying meat to local small settlements and passing trucks on the EN1. A similar but even more serious long-term threat can be found in the extensive and seemingly increasing illegal logging operations that became evident during aerial surveys of Coutada 5. Certain species of hardwood trees have become scarce to the point of local extinction. The developers and managers of Coutada 5 are thus faced with a growing social and ecological threat that would become increasingly more difficult to control.

5.4.3 Basis of land tenure

All land in Mozambique is the property of the State. This simple fact complicates the rights of the concessionaire of Coutada 5: usufruct rights were transferred, and with it a number of responsibilities, but not ownership of the land. The Land Law defends the rights of communities in instances where the legal acquisition of use rights of their land have been transferred to another individual or company, such as happened in Coutada 5. The communities' land rights are defined by customary norms (national and local) and the individual's length of residence of the particular area. Normally an individual's claim to land 'title' would be based on the land having been occupied for more that 10 years by the specific household. Any disputes arising from the recently occupied sites in Coutada 5 may thus be easier to resolve, since the tenure rights of at least some of the occupiers may legally be questioned in favor of Coutada 5.

5.4.4 Access to land: conflicts

It is not certain whether land use rights in a formally protected area such as Coutada 5 are defined and classified according to the same principles applying elsewhere. However, it is an inescapable fact that the principals of Coutada 5 should tackle especially the resettlement process as if the same principles and laws applying to the rest of the country, also apply *situ situ* to the total local situation. The whole process of involving the communities in changes of land use and access (or prohibited access) to land resources should evolve around *systematic consultation.* A Public Consultation and Disclosure Plan (PCDP, see below) has been drawn up and is in the process of being implemented

5.5 POPULATION CHARACTERISTICS

A full Social Impact Assessment (SIA) is currently (August 2013) underway. The results of the survey should provide information as to the following aspects, which are currently largely unknown:

- The distribution of households in the core wildlife-wilderness area
- Religion, and the sociological impacts of religious beliefs
- Duration of tenure at the local site?
- Living conditions: houses per family, house construction material, latrines
- Demography: family size, ratio men:women, sex of household heads, age of household heads, number of dependents per family, duration of tenure at the site, number of members living/working somewhere else;
- Education: literacy rate, percentage of household heads being illiterate, level of education (schooling)
- Health: percentage of families with major health problems previous year, malaria, availability of health facilities, cost of medical treatment
- Agriculture practiced (kinds and products; see also below)
- Is hunting practiced?
- Employment (see also below)
- Is logging practiced?

The missing data will be incorporated in the 2nd Iteration of the BBP in early 2014.

5.6 ECONOMIC ACTIVITIES: LIVELIHOOD SOURCES

A full Social Impact Assessment (SIA) is currently (August 2013) underway. The results of the survey should provide information as to the following aspects, which are currently unknown:

- Economic activities per region (circle)
- Principal economic activities
- Relative wealth of the family (ownership of houses, size of fields etc)
- Average monthly income
- Expenditures (for eg on food, clothes etc)
- Economic constraints listed by the respondents
- Customary resource management (control over hunting, control over fishing, freedom of land access, freedom of land use, access to land by newcomers, access to resources such as wood)
- Land use - agriculture (average size of land 'owned'; labor available for cultivation; produce more than immediate requirements of family?; sale of excess products?; products grown?; location of cultivated lands?; planting seasons, eg different cycles during year?
- Animal husbandry (cattle, goats, chickens etc)
- Fruit trees?
- Possible surplus crops for sale?
- Markets for produce?
- Agricultural development constraints (as listed by the families)
- Natural resource-use of land based products (grass, reeds, poles, firewood, palm wine, medicinal plants, wild fruits, hunting, logging of hardwood, collecting honey)
- Gender roles in agriculture
- Informal trade and markets (number of traders etc)
- Mobility (of the population, transport access)
- Employment (opportunities, salaries, access to employment opportunities);
- NGO activities
- Water supply and electricity
- Public services access

The missing data will be incorporated in the 2nd Iteration of the BBP in early 2014.

CHAPTER G6: SOCIO-ECONOMIC IMPACTS: COUTADA 5

6.1 BACKGROUND

Two project-based socio-economic impact scenarios should be considered, the one imaginary and the second one actual.

- Scenario 1: No project.

In the absence of an AFWR project, the following significant longer-term trends would have resulted:

- The natural resources of Coutada 5 would have been decimated to a level where any recovery would have been impossible
- The rural population of the Coutada would have been unable to achieve the probable socio-economic benefits, including substantial employment opportunities, arising from the development of the Coutada.
- No resettlement would have been necessary
- The huge environmental and ecological benefits arising from the effective management of the Coutada, would have been impossible to achieve
- The ecotourism developments arising from Coutada 5 would have been non-existent, to the detriment of the whole region.

- Scenario 2: Project 'as is'

  This actual scenario is highlighted below

6.2 SUMMARY OF KEY SOCIO-ECONOMIC IMPACT ISSUES

The following list of key issues includes those with the most important social and economic impacts:

- The curtailment of the bush meat trade and of the illegal logging operations, will alienate the individuals who were involved in such ventures from their erstwhile sources of food and/of income. It would be impossible for AFWR to provide alternative places for them to continue to ply their illegal trade.
- There is a real risk that cash compensation paid to resettled people during the resettlement process will not be used for long-term livelihood restitution, thus reducing the capacity of those families to regain their former standards of living
- Resettled households may not fit in with their new host communities, and may end up being regarded as unwelcome outcasts.
- Those resettled household who were resettled due to being involved with illegal activities in the core wildlife-wilderness area, may continue to practice their illegal activities in their new environment. AFWR may thus end up re-creating the same problem in a different locality.
- There is risk that the impacts, whether positive or negative, of the AFWR project may not be realized or understood by all the local people. Good intentions notwithstanding, enemies may be created due to misunderstandings. The effectiveness of the Public Consultation and Disclosure Plan (PCDP) will thus have to be ensured.
- Employment opportunities that have been, and will still be, created, will bring much more cash in circulation, thus stimulating local trade and long-term positive results

- Improvements in the marketing systems, the markets themselves, production systems and transport will probably lead to new growth nodes away from the major towns where most activities are currently centralized.
- Trusted channels for dealing with grievances currently do not exist, and will have to be established

6.3 SOCIO-ECONOMIC IMPACTS

6.3.1 Resettlement principles .

The basic resettlement principles are as follows (refer to the Resettlement Action Plan RAP below):

- The resettlement action will be in line with international and national requirements
- The scope of the resettlement program will be limited to the absolute minimum
- The hunting-based families living as squatters in the core wildlife-wilderness area will all be resettled.
- Resettlement will be a fully negotiated process involving the to-be-resettled families, the leader element of the area from where they are to be resettled, the host communities and the Government of Mozambique
- Compensation will be cash and goods in kind, as well as substantial relocation assistance
- The rehabilitation of the severely over-exploited Coutada 5 will place a huge and virtually insurmountable burden on the financial resources of AFWR. The rehabilitation process includes the full spectrum of establishing a huge new protected area, with an expensive social upliftment program as a non-negotiable necessity added to the process. AFWR will thus have to solicit donor assistance in order to fund those projects that would jeopardize the long-term financial viability of the project.

6.3.2 Ceded land

AFWR accepts that the land area of the host population ceding land to the resettled families, will be reduced in future. However, in all instances the areas to be settled are very sparsely occupied, if at all. AFWR is in the fortunate situation that suitable and adequate land available for settlement by new ‘immigrants’ is available.

6.3.3 Compensation

Compensation is partly in-kind (housing and land provided), partly in cash (to compensate for assets that were expropriated) and partly in kit (domestic utensils and farming equipment). AFWR also realizes the risk that cash compensation may end up being used for ‘luxury’ purposes, but can do very little to prevent it.

6.3.4 Local employment

Preferential employment of locals, as is the policy of AFWR, will provide the employees with skills that prior to the AFWR-era were at best only available to a very limited extent, if at all. Personal way-of-life skills of relatively unsophisticated employees, such as improved health standards, hygiene, construction skills and food preparation will also be vastly improved.

6.3.5 Employment of strangers

Whilst AFWR accepted, and implements, the principle of giving preference to local people in recruiting employees, some of the positions requiring greater skills have (and will continue to be) been filled by strangers from further afield. This unavoidable situation may give rise to local ill-feelings of strangers being of a higher status. This aspect will have to be addressed in the Public Consultation and Disclosure Plan.

6.3.6 Marginalisation of women

In relatively unsophisticated communities living in undeveloped rural areas, women tend to be easily ignored by both society and employee (in this case AFWR). It would be highly advantageous if a member(s) representing women in particular could serve on the various community structures that are in the process of being established.

6.3.7 Resettlement related impacts

6.3.7.1 Background

Any involuntary resettlement presents the resettled families with a multitude of social and personal obstacles. These impacts and obstacles are dealt with elsewhere in detail, but the basic principles of fair treatment, good neighborliness and cordial relations will be adhered to at all times by AFWR.

6.3.7.2 Policies, legislation and procedures

Most of the well-managed resettlement actions of the past took place according to the World Bank's widely accepted policy on Involuntary Resettlement. In addition, the IFC Handbook for Preparing a Resettlement Action Plan provides significant guidelines and was extensively used for this SIA and the subsequent Resettlement Action Plan (RAP). Mozambican guidelines provided basic compensation tables and some criteria for the Resettlement of Populations in Rural Areas, and furthermore stressed the necessity to involve the local administration (District level and below), to ensure that the process is locally appropriate and fair. The underlying principle is that the resettled people should preferably be better off than before, but definitely not worse off.

6.3.7.3 Methods used to assess the scale of resettlement

The rehabilitation of the Coutada 5 project involves *inter alia* the physical relocation of people resulting in their loss of shelter, productive assets (in some instances) and also

access to productive assets. This is considered to be physical displacement, but in some instances economic displacement (for example when the illegal loggers and poachers have to be moved) also applies. Compensation for economic displacement, however, should be regarded as contentious: the vast majority of the economically displaced people are/were involved with illegal and ecologically destructive activities, and financial 'rewards' may be questioned by law-abiding citizens.

The scale of resettlement, measured on an individual family basis, is thus more determined by the proven assets and production capacity of the family, and not by compensation for economic displacement arising from illegal activities. However, in order to maintain good relations and to prevent negative perceptions from arising, even those families involved with illegal activities will be compensated.

6.3.7.4 Lists of affected families

After completion of the SIA process that is currently under way, a full list of affected families will become available. This list will form the basis for all resettlement negotiations.

6.3.7.5 Location of resettlement areas

The to-be-resettled people will move to suitable host communities in the areas zoned for community and/or community-based agricultural development. The surface area of these zones has not been accurately calculated as yet, but is estimated to be at least 300 000 ha in extent, and will undoubtedly be large enough to accommodate the current and future needs of both the resettled people and their host communities. Some of the more recent immigrants into Coutada 5 have seemingly moved in from the north from the districts of Chibabava and Machaze, and may choose to relocate to those areas and not to zones in Coutada 5. Should this indeed be the case, such resettlement may take place outside Coutada 5 and will undoubtedly complicate the action.

6.3.7.6 Public consultation and attitudes

The Public Consultation and Disclosure Plan (PCDP) will need to address the requirements of proper public consultation between AFWR and the local communities. These consultations may be categorized in four groups and will be properly minuted:

- Public meetings
- Individual meetings
- Community meetings
- Focus group meetings

6.3.7.7 Resettlement and compensation issues

- AFWR will manage the resettlement in accordance with the RAP
- All involved parties will be kept informed by means of the PCDP

- Care will be taken to ensure that the host populations will not inherit conflicts
- Compensation negotiations will be transparent and will be fair to all concerned. The resettled people must have no feelings of animosity towards the project or AFWR.

6.3.8 Impacts on authority and leadership

The displaced communities may have an inadvertent impact on both the local authorities and on traditional leadership. AFWR will have to ensure that no social distance develops between the displaced people and their new leaders, or between the communities and their leaders in general.

6.3.9 Impacts on livelihood strategies

6.3.9.1 Impacts on opportunities

Various livelihood-enhancing opportunities will be created, or will automatically result from the deployment of the project. These include employment opportunities (possibly upwards of 400 at full development), capacity enhancement through training and the establishment of community structures, community development projects such as the new agricultural ventures, and possibly also assistance with improved education and health care.

6.3.9.2 Impacts on customary resource management

Since the Coutada is a formal gazetted protected area, no community resource management systems were ever put in place. This resulted in virtually no control measures being implemented, and in turn led to drastic over-exploitation of the biodiversity resources and the current urgent need for a full-scale rehabilitation program to be launched. AFWR will thus have to establish and assert control, but in collaboration with the local communities. The principle of co-management and CBNRM, as elucidated elsewhere, will be applied.

6.3.9.3 Impacts on natural resource use

The displaced people, as well as some vagrants who operate as illegal bush meat hunters and those who are seasonally involved with the *michema*-process (making an alcoholic beverage from ilala-palms), will lose access to those sites which are situated in the core wildlife-wilderness area. At a later stage, AFWR will also have to monitor the situation outside of this core area and may be forced by ecological considerations to restrict (or even prohibit in certain cases) the use of the more vulnerable natural resources in the Coutada *per se.* AFWR will urgently endeavor to abolish the bush meat trade, thus ruling out access to the Coutada for illegal hunting purposes on a permanent basis. Since the *michema*-process unfortunately cause the main stem of the ilala-palm to die off and is thus not sustainable, access for this purpose to the core wildlife-wilderness zone will also need to be curtailed. The collection of firewood and wild honey inside the core wildlife-wilderness area will also need to be prohibited. These project-related impacts on the use

of natural resources by the local people will have to be communicated in such a way that the reasons for the ban are clearly understood, without creating undue animosity. The people must be made to understand the reasons for creating an area for wildlife to roam freely, and the benefits that they, collectively and individually, stand to reap from establishing a biodiversity-based venture. Here again the necessity for an effective PCDP is illustrated.

6.3.9.4 Impacts on agricultural practices

Some of the to-be-resettled families currently living inside the core wildlife-wilderness area practice slash-and-burn crop production. This system will cease once the smallholder farmers have moved out, hopefully to be replaced by new modern agricultural techniques in the settlement areas. Outside of the core wildlife-wilderness area, outdated and ecologically-destructive agricultural practices will also (hopefully) gradually be replaced by permaculture ventures. Another benefit would be that the smallholder farmers would be much better trained and equipped to practice their trade, than was previously the case.

6.3.9.5 Impacts on trade and local economy

The local economy will be greatly influenced, in a positive manner, by the Coutada 5 project. The circulation of cash on levels previously unheard of will stimulate developments in the local trade scenario, with new markets and trading outlets probably coming into being. Especially the local informal trade will probably benefit hugely.

6.3.9.6 Impacts of improved access

In time AFWR will improve the currently completely inadequate road network in Coutada 5. However, these roads will be constructed for management purposes and many of them may be inaccessible to the local people. The main thoroughfare through the core wildlife-wilderness zone, linking Jovane with the EN1 main road, will be closed for pedestrian and bicycle traffic, but a ferry system will probably be instigated. This mode of transport will be hugely beneficial to the current non-motorized users, who have to traverse the almost 60 km long road on their own steam. Alternatively the road may have to be rerouted further to the south.

6.4 OTHER ECONOMIC IMPACTS

6.4.1 In-migration

The various development initiatives arising from the project, will make the Coutada more attractive to live in. Strangers may thus flock in, upset the existing social fabric, complicate various policies and endanger the community structures. Unchecked in-migration will be directly detrimental to the existing communities' way of life and their expected increase in livelihood levels. The onus will rest on the traditional and other leaders, to balance such as influx with the ability of the Coutada to keep on offering a better life for all.

6.4.2 Economic opportunities

6.4.2.1 *Ecotourism activities*

No final assessments have been made as yet, but it is likely that, in addition to the already existing new lodge along the EN1, three new AFWR wilderness/hunting camps will be operational at full development. In addition, at least two but more likely three wilderness trails camps should become operational in the medium term. These facilities will cater for hunters, non-consumptive eco-tourists and wilderness-based hiking and 4x4 trails. It is at this early stage impossible to even estimate the number of tourists that would be involved, but the financial implications for AFWR and the other involved parties would be positive and substantial.

In addition, it is entirely possible that at least some of the investors in the 22 wildlife blocks will choose to operate small ecotourism ventures, especially once the wildlife re-introduction program has been successfully implemented and the wilderness area becomes available for ecotourism usage.

6.4.2.2 *Access to services*

The Coutada development may conceivably place strain on the already overburdened rural services rendered by the Government of Mozambique: firstly rural health care will have to be improved, secondly it is likely that education facilities will have to be upgraded (or provided from scratch in some areas), and thirdly even that better policing will have to be done. The ability of the GoM to timeously deliver these services is doubtful.

6.4.2.3 *Water supply*

Water supply to especially the resettled people will probably have to be improved, or provided where currently none is available.

CHAPTER G7: MITIGATION AND SOCIAL MANAGEMENT MEASURES

7.1 MITIGATION AND MANAGEMENT MEASURES: A COMMUNICATION APPROACH

To implement an effective PCDP is imperative, otherwise AFWR will be extremely hard pressed to achieve its objectives. A planned and systematic use of communication media and structures is essential to get the local communities to accept change. Communication is the basis for creating awareness, for consensus building, for generating participation in processes of change and development, for making informed decisions and for resolving conflicts. Communication is also the only viable means that AFWR can employ to bring about behavioural and attitudinal changes. Such a communication approach may focus on three levels: firstly debate and awareness-raising, secondly assistance in facilitating the

acquisition of new skills and finally the creation of an enabling environment to facilitate these required changes.

The implementation of a participatory approach will focus on firstly the physically displaced population who will be compensated by various means, secondly the economically displaced population eligible for compensation and finally the rest of the population that may benefit from community development activities.

The process for involving the aforementioned groups in activities to ensure their socio-economic development may include:

- The formulation of a communication strategy (which is a non-negotiable imperative)
- The choosing of intermediaries (if AFWR should be unsure of its own in-house ability)
- Forming strategic alliances with public media
- Combining the participatory approach with a focus on livelihood restoration of the resettled families
- Using examples of successful projects elsewhere
- And in the longer term encouraging the community to operate its own systems

Extensive mitigating measures will have to be taken to manage resettlement:

- Compliance with international guidelines is a non-negotiable
- The resettlement program must include negotiated compensation, the assessment of potential resettlement sites, negotiation with the host communities, the introduction of new agricultural methods, and holding meetings with all the involved parties
- Special attention needs to be given to groups that are exposed to specific risks, for example women
- The restitution of livelihoods should consider all the known risks, for example the payment of substantial amounts in cash should be avoided if at all possible.
- Conflict may arise from unexpected quarters, and AFWR should be prepared to use the PCDP, local leaders and government institutions if necessary to effectively combat such conflicts

The participatory planning process should lead to the establishment of an acceptable and functional Community Trust, as well as subordinate Coutada Community Conservation Committees (CCCC) and Coutada Community Agricultural Committees (CCAC).

7.2 EXECUTION OF MANAGEMENT AND MITIGATION MEASURES

The abovementioned mitigation and management measures are dealt with in the Resettlement Action Plan (RAP), the Community Development Plan (CDP) and the Public Consultation and Disclosure Plan (PCDP) outlined below. In addition, a number of Operational Plans (OP) will be compiled to provide the required implementation details.

CHAPTER G8: SOCIAL MONITORING AND COMPLIMENTARY STUDIES

8.1 LAND USE AND NATURAL RESOURCE-USE MONITORING

After the resettlement program has been completed, continuous monitoring of the use of the land and of the natural resources, in order to maintain sustainability, will be undertaken on a routine basis by AFWR staff

8.2 RESETTLEMENT MONITORING

The success or otherwise of the resettlement program will be monitored to ensure that the objectives were met and that mitigation measures are implemented timeously (if necessary).

PART H: COMMUNITY AFFAIRS: SOCIAL ACTION PLANS

The three Social Action Plans that follow are based on the Social Impact Assessment (SIA) and the rationale discussed in Part G above.

CHAPTER H1: RESETTLEMENT ACTION PLAN

1.1 PRINCIPLES AND POLICIES FOR A RESETTLEMENT ACTION PLAN (RAP)

1.1.1 Purpose

The purpose of this RAP is to document the resettlement process that will be undertaken to physically resettle those households that are currently living in the core wildlife-wilderness zone of Coutada 5, and to develop alternative livelihoods for these and other households who are currently mainly reliant on the ecologically destructive swidden/shifting agriculture system.

1.1.2 Operational context

The planning principles that led to the formulation and structure of this RAP are based on the World Bank's Operational Policy OP 4.12 (2001) and the IFC's Handbook for Preparing a Resettlement Action Plan (2001).

The most important principles of these principles, as it will be applied to Coutada 5, may be summarised as follows:

- The OP 4.12 on Involuntary Resettlement ensures that the population displaced by a project receives benefits from it. This covers those with usufruct or customary rights to the land or other resources taken for the project, in this case within Coutada 5
- OP 4.12 is inclusive, ensuring that all those affected both directly and indirectly by project developments are compensated as part of the project.
- Resettlement covers *physical displacement* and *economic displacement*. Thus the need for resettlement and compensation not only refers to the impact of the development on displaced people having to move from A to B, but also to the impact on the economic resource base and means of livelihood of local communities. The absence of legal title does not limit rights to compensation. Preference should be given to land-based resettlement strategies for displaced people whose livelihoods are land-based (in the case of Coutada 5 suitable land for resettlement is available)
- The policy clarifies the principles covering household resettlement and restricted access rights. The policy is specific about the resettlement in the case of loss of access rights linked to the designation of protected areas.
- The need to involve communities in the planning and implementation of interventions that result from these policies is stressed.

- Conflict resolution mechanisms should be identified as part of the above planning and implementation.
- Particular attention must be paid to the needs of vulnerable groups, especially those below the poverty line, the landless, the elderly, women and children, indigenous peoples and ethnic minorities.
- Implementation of resettlement activities must be linked to the implementation of the investment component of the project, to ensure that displacement or restriction of access does not occur before necessary measures for resettlement are in place. Measures prior to displacement include provision of compensation and of other assistance required for relocation, and preparation and provision of resettlement sites with adequate facilities. In particular, the taking of land and related assets may take place only after compensation has been paid and, where applicable, resettlement sites and moving allowances have been provided to the displaced persons.
- Cash compensation for lost assets should be paid for livelihood sources that are not land-based. Compensation levels should be sufficient to replace the assets at full replacement cost in local markets. The World Bank Environmentally and Socially Sustainable Development Network's (ESSD) definition of losses requiring compensation also includes the case of people who may lose the right to use resources without losing possession of them. Such involuntary loss of access to resources may also be considered involuntary resettlement. Payments may be staggered to facilitate their use for livelihood restitution where appropriate.
- Displaced persons and their communities, and host communities receiving them, should be provided timely with relevant information, consulted on resettlement options, and offered opportunities to participate in planning, implementing, and monitoring resettlement. Appropriate and accessible grievance mechanisms must be established for these groups.
- Infrastructure and public services must be provided as necessary to improve, restore, or maintain accessibility and levels of service for the displaced persons and host communities.
- Alternative or similar resources should be provided to compensate for the loss of access to community resources such as fishing areas, grazing areas and fuel resource areas.
- Patterns of community organization appropriate to the new circumstances that resulted from the resettlement actions, should be based on choices made by the displaced persons.

1.1.3 Socio-economic context

For a full background on the social and other factors that may influence the resettlement action on Coutada 5, see Part G above. The following brief socio-economic outline indicates the socio-economic context, and principles, within which the RAP was developed, but also clearly illustrates the deficiencies in AFWR's current knowledge about the socio-economic realities of the resettlement action. This BBP, and the incomplete SIA and RAP, will be updated during early 2014 when the results of the various biodiversity surveys will also be available:

- An unknown number of families whose livelihoods are currently mainly based on subsistence swidden agriculture, inhabit Coutada 5 (the people living in the major town of Machanga are not included in the RAP). The large majority of these families will probably not be resettled, but will continue to live in the areas currently occupied by them. These areas have been zoned as community-use areas (refer to the zoning map). Initially only those families living in sensitive areas of the core wildlife-wilderness zone will be resettled. The resettlement action will take place in a phased manner, starting with those families affected by the early development phases of the project.
- Preliminary results of the household survey demonstrate that the large majority of prospective to-be-resettled families are agriculturalists. However, an unknown percentage is involved with the bush meat trade and illegal logging. All these families are to a lesser or greater extent dependent on the use of natural resources within the Coutada.
- Preliminary indications are that illiteracy is widespread, especially amongst the people living in remote and inaccessible areas, and amongst the older adult population.
- Early indicators of security and wealth in relation to the activities practiced above, were identified as agriculturalists cultivating larger than average land sizes, and being in possession of utilities such as decent houses, livestock and bicycles.
- The average land area used for cultivation has yet to be determined, but will probably be substantially less than two hectares. Early indications are that most of the agricultural produce from the past year was used for subsistence. Early results indicate that the seasonal sale of alcohol distilled from ilala palm trees, play an important role in the local economy.
- Preliminary indications are that the local people living in the rural areas of Coutada 5, not surprisingly, identified a lack of money, a shortage of labor, the lack of good quality seeds, a shortage of markets and marketing facilities, and a shortage of effective transport as major economical constraints.
- At this early stage of the development of the project, indications are that an increase in money circulating due to project activities, already led to an upsurge in economic activities. An unfortunate but possibly unavoidable side effect is the apparent influx of people to the area, in an effort to gain from the project-induced economical upswing.
- A full and detailed baseline survey of all households whose built structures will be displaced by the development, and those whose existing economic activities will be displaced, has not yet been completed. This is one of the first activities scheduled to be carried out as part of the RAP. .

1.1.4 Ownership of the project

The land and other natural resources of Coutada 5 “belong” to the people that legally “own” and till the land. However, “ownership” of Coutada 5 has been contractually transferred to AFWR by the Government of Mozambique. As such AFWR is responsible for the structured and responsible development of the Coutada. “Ownership” of the RAP,

in all its facets, would thus also be vested in AFWR. Accountability to make the RAP work and the responsibility to carry it out, thus rests squarely with the developers. In its execution of the Biodiversity Business Plan, however, AFWR accepts the principles of co-management and community-based natural resources management. The local people will thus be involved as far as is feasible.

1.1.5 Standardizing on procedures

In order to enhance the marketability and replicability of the management procedures and processes that will be used, the following RAP for the resettlement of affected households in Coutada 5 is loosely based on the abovementioned operational policies of the IFC and World Bank, as well as the various development or planning models as used elsewhere in this BBP. Many of the planning and operational principles embodied in these plans would *situ situ* also be applicable to the resettlement plan, and should be read in conjunction with the RAP that follows below.

1.1.6 Lessons learned

In the "lessons learned" section of the plans dealt with above (see Part D), particular attention was devoted to lessons that could be learned from past experience and other projects. These lessons were discussed in some detail and will not be repeated here. The lessons learned are almost universally applicable and will be considered when planning, implementing and managing the RAP.

The following "lessons" were, amongst others, listed:

- Timing (little time is left to launch and execute the RAP; unsubstantiated rumours may cause distrust)
- Scale (the plan is complex but still tractable, and will be executed in phases)
- Project size (the 14-point plan breaks the RAP down in manageable units)
- Communication (local communities need to be informed; poor communication may derail the project)
- Participation (the RAP will be driven and executed by AFWR, with substantial community inputs)
- Decentralisation (the local civil authorities will be used/involved wherever possible)
- The human resource (also involve women and youth and prevent their exploitation)
- Cost and benefit (real benefits will lead to behavioural change)
- Private sector involvement (foster private sector initiatives inside the community)
- Monitoring and evaluation of the process (involve the community)
- Research and data collection (involve the community wherever possible)
- Sustainability (build human capacity to ensure the long-term success of the project)
- Ownership (vested in AFWR, but the local people will be involved to ensure that they have a say in their own destiny)

The results of many resettlement projects in developing countries have been fully chronicled. The successes and failures and the reasons for it are well known, as are the many pitfalls that should be avoided. In the case of Coutada 5 there would thus be no need to reinvent the wheel

The local communities, but especially those that would be affected in some way or other by the resettlement program, will be involved in an active and participatory manner right from the beginning. The principle of co-management (see Part C) will be applied, to ensure that the RAP becomes regarded by the local people as a positive outcome for all concerned.

1.1.7 From lessons to principles

A resettlement plan deals first and foremost with people, and only involves the environment and specifically biodiversity in a peripheral and almost incidental manner. Such a plan will obviously differ in many respects from natural resources-based plans. The planning and execution principles that were considered and accommodated in the formulation of the RAP, however, were generally similar to those used for the abovementioned biodiversity plans and may be summarized as follows:

- The plan is structured to be as simple as possible in terms of execution, and will not necessitate extensive behavioural changes over a short period of time.
- The plan is built on substansible and sustained external funding, because of expensive social-based interventions being involved.
- The plan will only succeed if the local communities perceive and experience the plan to be fair and transparent.
- The RAP will as soon as possible be workshopped with the local people in an organized manner
- Without the formal community structures as outlined in the RAP below and elsewhere in the BBP (see Part L) being put in place, the implementation of the plan would be seriously jeopardised.

1.2 MANAGEMENT OBJECTIVES, PRIORITIES AND ACTIONS FOR THE RAP

14 – point procedure for implementing the Resettlement Action Plan for Coutada 5

A simple 14-step process, based on the same principles and procedures as the abovementioned biodiversity plans, will be applied to the implementation of the RAP for Coutada 5. The steps are not as closely interlinked as for the natural resources plans, but nevertheless form a chain that bring accumulative strength with every subsequent step added. Leaving one out, or not doing it thoroughly may cause the entire chain to fall short of the mark, and may cause the entire resettlement management process to fail entirely. It is important to note that some of the steps are overlapping, and that some of them can be implemented concurrently rather than in a linear fashion.

The 14 steps are:

Step 1:	Establish an organizational framework
Step 2:	Draw up an implementation schedule
Step 3:	Determine potential impacts and magnitude of displacement
Step 4:	Identify key issues
Step 5:	Review of legal and policy framework
Step 6:	Determine eligibility, compensation and entitlement
Step 7:	Liaise with involved and affected parties
Step 8:	Evaluate assets
Step 9:	Negotiate compensation
Step 10:	Determine resettlement options
Step 11:	Execute the RAP in phases
Step 12:	Influx management and control
Step 13:	Establish and implement grievance procedures
Step 14:	Establish procedures for and undertake monitoring and evaluation

1.2.2 Application of the 14-point plan

For each of the steps the purpose is briefly noted, the rationale is given and discrete actions to be taken are listed. Finally, where applicable, an assessment of potential problems and dangers (threats) may be provided.

STEP 1: ESTABLISH AN ORGANIZATIONAL FRAMEWORK

(1) Purpose

The purpose of Step 1 is to ensure that the organizational framework that would be necessary to implement the RAP, is established.

(2) Rationale

As was the case with the biodiversity plans dealt with elsewhere in the BBP, the RAP would be dependent on similar organizational structures to ensure that the plan gets implemented in an orderly fashion.

(3) Actions to be taken

Resettlement and compensation of project affected people will involve the *Coutada Management Committee* as the implementing structure regarding the application of policies, and operational planning, coordination and supervision, after consultation with the *Community Trust Committee* (CTC). The Management Committee should analyze the results of the population census and social impacts assessment currently being undertaken, and recommend investigative follow-up for all identified cases of people affected by the project activities. The Management Committee will continuously review progress with resettlement issues and will, together with the CTC, also be responsible for the redress of grievances.

A *AFWR/Community Resettlement Task Force* comprised of three members of the ManCom, hopefully a local government representative and two members from the to-be-established Community Trust, will be established to deal with the implementation of the RAP. The Task Force will be responsible for organizing and where possible participating in consultation and negotiation of compensation alternatives, with the project affected people. It is likely that AFWR may have to provide temporary board and lodging, and obviously also transport, to the government representative

The Task Force will supervise physical resettlement and compensation payment, ensuring that the whole process is documented adequately from the initial meetings, through negotiation and contract agreements on compensation and timing, to the receipt of signatures for all compensation agreements.

Responsibility for monitoring and providing follow-up assistance to resettled families should be organized from this level, with the Task Force playing a prominent role. The Task Force should provide information about the resettlement process, the compensation policy and listen to grievances, so that problems may be identified early and dealt with in a timely fashion.

When additional technical assistance is required for the supervision, or quality inspection, of activities such as water supply, agricultural extension and communication, the Task Force will, if necessary, enlist the services of appropriate specialists.

At the level of the community a local *Resettlement Committee* constituted by members of the host and resettled community, local traditional or influence leaders, nominees from the churches and other institutions at this level, will be formed. The Committee's principle objectives are to ensure justice and equity at local level and to channel grievances to the Task Force.

None of the resettlement structures should be dismantled until full rehabilitation of relocated families has been achieved. It is expected, however, that by that time the structures themselves will have changed their roles so that they are monitoring and facilitating the process of development in the community, rather than that of merely of rehabilitation.

STEP 2: DRAW UP AN IMPLEMENTATION SCHEDULE

(1) Purpose

The purpose of Step 2 is to draw up an implementation schedule to guide the implementation of the RAP.

(2) Rationale and actions to be taken

An implementation schedule will be drawn up as soon as the social impact assessment has been completed, and the extent of the resettlement action is known.

STEP 3: DETERMINE POTENTIAL IMPACTS AND THE MAGNITUDE OF DISPLACEMENT

(1) Purpose

The purpose of Step 2 is to determine the social impacts and the magnitude thereof that need to be addressed in the RAP.

(2) Rationale and actions to be taken

It is well known that inadequately planned resettlement, particularly of families moving into new locations and living in a more densely populated locality than they ever have before, may lead to various risks. For example resettled people may be unable to regain their livelihoods rapidly, and some families may indeed end up worse-off than they were before. Key areas to watch out for are creating landlessness; the loss of families' or clans' cultural space and identity, or cultural impoverishment; economic and social marginalization; increased morbidity and mortality often as a result of more dense settlement patterns; food insecurity from reduced self-sufficiency and the need to change local arrangements for food supply; loss of access to common property such as woodlands, lakes and grazing lands that may cause livelihood deterioration; and finally social disintegration as a result of changed community structures and social organization and changes in informal networks and relationships that undermine and impoverish the people.

The most significant negative social impacts of the project on the population are the results and potential consequences of installing a fenced-in protected area, from which a number of families/ households must be removed, and where others will lose access to resources they have customarily used.

Negative socio-economic impacts are almost all related to resource use practices. This includes the temporary loss of agricultural land, and access to areas inside the fenced-in protected area (the wildlife-wilderness zone) where they previously used freely available resources such as wild honey, ilala palm wine and woodfuel. Displacement caused by the implantation of the fenced wildlife-wilderness zone and the subsequent resettlement of relocated families in a 'village' system, may result in concentrating intensive resource use in smaller areas with negative short and longer-term effects mainly due to depletion of poor soils.

No estimate is at this early stage available as to the number of families that will have to be resettled. The current social impact assessment and census of families presently living in the prospective wildlife-wilderness zone, will in the near future be known. Only then will it be possible to employ a phased resettlement action.

Like virtually any other resettlement action, the Coutada 5 resettlement process has a number of risks associated with it that may affect relocated families and host families negatively, but the two most pressing at this moment are the potential for loss of opportunity to obtain the use of equal or better land in equal or better quantity than prior to moving, and a system for ensuring equity. The weakest will lose most if there is competition for land and resources in the resettlement area, undermining their capacity to re-establish their livelihoods. Contributing to the

risks is the potential of losing the expected benefits of compensation paid for annual crops if cash compensation is used for immediate short-term lifestyle improving investments. The additional demands on natural resources, such as land, surface water supplies, and woody materials for construction and fuel made in and around the more densely populated resettlement areas, will raise the risk of their depletion and degradation and the impoverishment of their users.

STEP 4: IDENTIFY KEY ISSUES

(1) Purpose

The purpose of Step 4 is to identify the key issues that need to be addressed during the development and implementation of the RAP, and the potential consequences that the Phase I resettlement process has on the design of the Phase II program.

(2) Rationale and actions to be taken

The first phase of the resettlement action will include those to-be-resettled families living in the first area to be developed in the wildlife-wilderness zone. The scale of the first phase of the resettlement program is not yet known, and will be determined by the results of the current social impact assessment. Key issues relating to, and possibly impacting on the resettlement program include:

<u>Compensation</u>

- The risk of cash compensation not being used for longer term livelihood restitution and the consequential reduction of capacity of families, particularly women and children to regain their former living standards.
- Monetary compensation is likely to benefit men in families more than women, given the customary dominance of men in decisions over use of money;
- Potentially discriminating competition for natural resources in the resettlement area is difficult to predict, but may become a real risk. In order to prevent this scenario from developing, the intentions of AFWR to apply a fair and equitable system, should be abundantly clear.
- Steps will have to be taken to ensure that enough land in the resettlement area is available to compensate the resettled families for the losses that they incurred. Future population growth, as well as the introduction of better agricultural production techniques allowing smaller plots to be cultivated, should be taken into consideration.
- In Mozambique it is customary for a family to attain full usufruct rights on land which they have settled for at least 10 years. It is likely that a number of the to-be-resettled families in Coutada 5 have not occupied their land for 10 years, thus possibly affecting those families' rights to claims, and the compensation to be paid. The GoM will have to provide guidelines to AFWR in this regard.

<u>Preparation for resettlement</u>

- The land area for resettlement has not been demarcated yet. However, it is likely that settlers will have to negotiate and acquire customary use rights themselves for areas beyond the immediate vicinity of their new houses. While this process is culturally appropriate and accepted, the lack of knowledge about who benefits and who loses, and the lack of opportunity for ensuring equity in land-for-land compensation raises the risk of the weaker families and family members losing out without planning alternative livelihoods. In addition a number of families in the host population may possibly be affected by having to reduce their land size by ceding it to the families being resettled, although this is unlikely to happen.
- AFWR should ensure that the land identified for resettlement purposes, is indeed suitably with regards to not only size, but also soil fertility. On poor soils the fertility of the soils will be further depleted, productive capacity will drop and crop production will not meet expectations. This may result in the need to resort to significant off-farm income generation and the consequent dangers of low income, poor health and increasing poverty for people unused to the type of occupation, particularly women.

Resettlement sites

- Great care will be taken in choosing resettlement sites, in order to ensure that all the requirements mentioned in this RAP are indeed met.
- Should some of the to-be-resettled families choose to resettle to areas outside of the jurisdiction of AFWR, the process will become much more complicated. Steps will be taken to address this potential exacerbating situation, once the results of the social impact process are available.

Communication

- Effective channels for the communication of information and the address of grievances will be established.
- Active steps will need to be taken to ensure that no rift develops between the resettled and host communities and their traditional and other leaders. Such a rift may easily come into being if the people perceive their leaders to be on the side of AFWR, to the detriment of their subordinates.
- The process of consultation needs to highly effective, so that two way communication flows can facilitate the following issues:
    - The host communities must be involved in taking decisions about the resettlement processes;
    - The impact of alternative farming technologies in reducing the amount of land required for farming per family, must be communicated;
    - Families should be clearly informed about assistance available to them to re-establish their livelihoods, and whether employment by AFWR is an alternative for these families (if so preferred);
    - Trusted and reliable communication channels to communicate grievances must be installed and operational.

- Extensive and objective documentation of the resettlement process will need to be kept.

STEP 5: REVIEW OF LEGAL AND POLICY FRAMEWORKS

(1) Purpose

The purpose of Step 5 is to ensure that the resettlement process takes place in accordance with AFWR policies as embodied in this BBP, with relevant local legislation and policies, and also with international policies and guidelines.

(2) Rationale and actions to be taken

There is no legislation in Mozambique that directly covers involuntary resettlement. It seems as if most resettlement procedures undertaken to date by private / public sector development initiatives that have required resettlement of rural families, have generally followed the World Bank's Operational Policy on Involuntary Resettlement.

The following national legislation or policies of Mozambique are relevant for guiding specific aspects of the resettlement process (see also Part A):

- The Land Law 19/97 provides the basis for defining affected people's land use rights, providing the details of rights based on customary claims and the procedures for acquisition of title for use and benefits by communities and individuals. The law recommends a consultation-based process that recognizes customary rights as the means for identifying the claims of communities and individual members of communities without title. Art 24 identifies that in rural areas local communities should participate in: a) the management of natural resources, b) the resolution of conflicts, c) the process of obtaining title as established in no 3, of Art. 13 of this law, and d) in the identification and definition of the boundaries of the land they occupy.
- The fundamental principles of the Mozambican Land Policy are:
    - Maintenance of the land (including Coutada 5) as the property of the State.
    - Security of access and use of land by the population and investors, thus recognizing the customary rights of access and management of the land of rural resident populations, whislt promoting social and economic justice.
    - Guarantee of access and land use rights for women.
    - *Promotion of national and foreign private investment without prejudicing the resident population* (this is especially important to AFWR), thus ensuring benefits to them and to the national public exchequer.
    - Active participation of nationals as partners in private undertakings.
    - Definition and regulation of basic directive orientations for the transfer of rights of land use between citizens or national companies, whenever investments have been made in the land.

  - *Sustainable use of natural resources in order to guarantee the quality of life for the present and future generations, guaranteeing that the areas of total and partial protection maintain their environmental quality and the particular ends for which they were constituted*. Included here are the coastal zones of high biodiversity and the land along interior waters.

- Compensation for losses incurred as a result of relocation does not have any official guidelines other than the basic compensation tables produced by the Ministry of Agriculture and Rural Development, covering the minimum values attributed to various tree crops of different ages. Tables are available and produced at provincial level for the purpose of respecting the local values of items.
- In 2000 the Ministry for Coordination of Environmental Affairs (MICOA) produced extensive guidelines on the Criteria for Resettlement of Populations in Rural Areas that were aimed to facilitate the process of resettlement after the floods. *These cover the need to provide access to resources adequate for the development of families after resettlement* based on land size, distance to used resources and provision of public services.
- The provision of infrastructure and services for resettled populations (also applicable to Coutada 5) would need to follow relevant national technical laws and regulations including:
  - The Water Law (16/91), National Water Policy (1995) and Social and Technical Implementation Manuals (2002/3);
  - Technical specifications for the construction of health units from GACOPI, the Office for Coordination of Public Investments of the Ministry of Health;
  - Technical specifications from the Planning Department of the Ministry of Education;
  - Quality control for all other construction of public utility should minimally follow standards used by the Provincial Directorate of Public Works.
- The Provincial Directorate for Women and Coordination of Social Action and the sector's National Institute of Social Action are responsible for subsidizing the poorest and indigent members of the population, and for ensuring that the rights of the most vulnerable are respected. While there are no specific legal guidelines for the social aspects of resettlement, Mozambique's ratification of the International Conventions of the Rights of the Child and Human Rights, Elimination of All Forms of Discrimination Against Women, Mozambique's agenda on Human Settlement and the Labor law define specific rights based on equity and equal opportunity without discrimination to the benefits of private enterprise and investments.
- It should be noted that all *Mozambican guidelines point out the importance of involving the Local Administration (District level and below) in the process of resettlement* to ensure it is locally appropriate, and so that government personnel may learn and apply similar procedures to other instances of resettlement in their territory. .
- International policies recommend that people affected by the project must be consulted regarding resettlement activities, provided with timely compensation for lost assets at full replacement cost, provided with alternative sites for relocation, and also that their

livelihoods must be restored to standards comparable to and preferably exceeding, those that prevailed before resettlement.

STEP 6: DETERMINE ELIGIBILITY, COMPENSATION AND ENTITLEMENT

(1) Purpose

The purpose of Step 6 is to determine the criteria that will qualify an individual, family or group for eligibility under the RAP for Coutada 5, and to identify the families that will be involved based on these criteria.

(2) Rationale and actions to be taken

The launching of the AFWR project to rehabilitate and restore Coutada 5, involves the physical relocation of people resulting in their loss of shelter, productive assets and access to productive assets to various degrees. The IFC considers this *physical displacement*. In addition to physical displacement, there are also families affected by *economic displacement*, the results of actions which interrupt or eliminate their access to productive assets, although they themselves will not be physically relocated. In the case of traders in bush meat operating inside Coutada 5 their activities are illegal, but they nevertheless should receive some form of compensation. The IFC's involuntary resettlement policy is designed to ensure that people who are physically or economically displaced as a result of the project are no worse off than they were before. The project developer has the additional potential of providing means of restituting livelihoods which aims to ensure resettled families become better off than they were before.

An assessment of the degree of impact on the livelihoods of to-be-resettled people in Coutada 5 is currently under way. The results will probably lead to Coutada 5 and specifically the wildlife-wilderness zone being divided into areas of resettlement priority. These priority areas will be directly based on the phasing in of the wildlife-wilderness zone, with the first people to be moved being those living in the first phase of the wildlife-wilderness blocks

<u>Procedures for assessing entitlement, compensation and other forms of assistance</u>

- The abovementioned census is carried out in order to identify those eligible for assistance, as well as providing a basis for discouraging an inflow of people ineligible for assistance. Names of all family members and their relationship to the head of the household, details of resource use and location and also household location using GPS coordinates is registered.
- Together with the abovementioned Resettlement Task Group, AFWR will investigate the basis of each of the identified claims of the identified families. Initially this should be based on interviews with the local leaders on their own, and then be followed up with visits to each affected family. Assessment of the families with partial economic displacement claims should be sensitive to their customary methods of obtaining access and using resources, so that it may be established which families will genuinely lose access and/or use of these as a result of the Coutada's development activities.

- The decision about entitlement should be made following analysis of all claims. Each family eligible for compensation or other assistance must be informed of the basis of the decision and the options for assistance that they have.
- This process should be fully documented including the decisions taken and their reasons at every step of the way. Should complaints be lodged against decisions about eligibility, these must be dealt with through the established procedures for communicating grievances described below.

Determining compensation

- Compensation will be determined by the Resettlement Task Group, in consultation with the District Administrator for Machanga.
- The form that the compensation should take will also be determined in advance
- In addition to cash compensation, the provision of basic building material and assistance with the erection of structures at the resettlement sites, it is envisaged that compensation in the form of household goods and farming equipment will also be paid. Though no final decisions as to this compensation-in-kind has been taken, it is envisaged that the following goods and/or equipment and/or food may be donated to the resettled families who will primarily be involved in farming activities:
    - One wheelbarrow
    - One bicycle
    - One spade
    - Two shovel picks
    - One 20 liter water container
    - One three-legged pot
    - One saucepan
    - Two plastic chairs
    - One plastic table
    - Cement for constructing the floors of the new houses (including training as to how to accomplish this)
    - One bag of maize meal per month per three family members for the transitional period, until crops are produced at the new site.
    - Seeds for replanting crops
- The above list may seem trivial, but it should be borne in mind that the people are very poor, and that the listed items will indeed make a huge contribution to upgrading the standard of their daily lives.

STEP 7: LIAISE WITH INVOLVED AND AFFECTED PARTIES ON A MACRO LEVEL

(1) Purpose

The purpose of Step 7 is to liaise with all the parties that will be involved with and/or affected by the resettlement action. This step will run concurrently with Step 8.

(2) Rationale and actions to be taken

Once the process has progressed to this point, liaison will progress to the details of the resettlement process. The AFWR/Community Resettlement Task Force will meet with the previously established Community Resettlement Committee (CRC), as well as with the relevant government institutions and traditional and administrative leaders. Public meetings involving the communities that will be directly implicated by the resettlement process (resettled as well as host communities), will then be held to explain the intentions and expected results of the resettlement program. Government will be prompted to take note of possible social impacts arising from the resettlement process, such as pressures on schools in the host community, or even the need to provide additional new schools.

STEP 8: EVALUATE ASSETS

(1) Purpose

The assets of all the affected households need to be assessed on-site in order to ensure transparency and fairness.

(2) Rationale

International policies and guidelines emphasize the importance of establishing compensation rates that should be applied consistently throughout the life of the project, in order to protect the developer from unjustified and exaggerated claims. The format for evaluating assets and reaching agreement on compensation amounts in Coutada 5, takes into account the internationally-accepted procedures.

The valuation of assets will be carried out through a process of consultation and negotiation with the heads of the households owning the assets. It is customarily recognized that the owner of the assets should identify the compensation value of these. It is also universally accepted that the closing of negotiations about compensation values, should only be considered when the assets owner pronounces satisfaction with the results. Thus, based on the foregoing, attributions of value will be standardized as far as possible, whilst respecting the following basic principles:

- Agreement of the affected population with the rates, deeming them fair and adequate, should be established at the start through consultation with representatives of the community, in this case the Community Resettlement Committee and also the community representatives on the AFWR/Community Resettlement Task Force;
- The compensation level should be sufficient to enable people to restore or better their standards of living after resettlement;
- Compensation payments should be made before any assets are acquired by the project and prior to resettlement - unless payments are staggered after resettlement to permit the use of the money for its intended purpose, namely the restoration of livelihoods;
- Local currency payments should be indexed to the US dollar to protect local people against local currency fluctuations and inflation.

During the on-site evaluation process, all shelter assets should be carefully examined and measured so that it is ensured that houses constructed in substitution are of better quality than the original ones. AFWR intends to construct 'traditional' houses that are improved with concrete floors and doors (provided that donor aid would be forthcoming). The quality of construction will be carefully monitored so that these houses that are temporary by nature, endure for at least a period of five years without any need for maintenance or substitution.

The quantities of other assets associated with livelihoods such as permanent tree and annual crops should be assessed according to the norms of the Provincial Directorate of Agriculture and Rural Development together with a representative of the sector so that size, age and productivity of the assets may be adequately identified. The table of compensation values used in Mozambique as a baseline for reference, should be used when families are unable to identify a value for their crops due to a lack of experience in this aspect. The official table will have to be used with discretion, since it may conceivably lead to an undervaluation of those assets.

The overall approach to community participation activities, using planned communication to facilitate the resettlement processes (refer to the Public Consultation and Disclosure Plan below), will be used to create awareness about the project, and will also present information about resettlement. An illustrated information sheet explaining eligibility, compensation rates and other entitlements, a timetable for implementation and information about grievance procedures could be produced as the first of a flow of regularly updated information, about progress with the resettlement process. In order to avoid grievances and misunderstanding, it is essential that effort is put into ensuring that affected community members are informed about their rights and responsibilities, and that they have channels of communication and grievance redress available to them.

(3) Actions to be taken

The following procedures will be employed during the asset evaluation process:

Procedures for evaluating assets of affected households

An *inventory* will be made of the assets that will be lost by each family, including physical structures: houses, latrines, wells and corrals; crops in the ground, land area for cultivation, residence, pasture and fallow; tree crops; income from other off-site activities and a list of the animals that will be moved. Enough information, backed by photographic records, to be able to identify the total income per family and the proportion that will be interrupted or lost due to project activity, will be gathered.

Procedures for calculation of compensation values involve:

- Identification of all shelter assets with the objective of the Coutada replacing these with buildings of a better quality in locations chosen by the resettling families. These will be backed by photographic evidence.
- Attributing monetary values to the crop assets affected by the project according to rates per crop agreed on between the government representatives and AFWR (in consultation

with the AFWR/Community Resettlement Task force) in relation to the recommended compensation values for the province of Sofala, and taking local market replacement values into consideration. Permanent crops should be identified in numbers of trees, and annual crops by the area planted with registered crop types. The compensation value of annual crops should be calculated based on the local market value of the average productivity of the area for one annual cycle of each key crop. The common system of intercropping complicates this process and compensation must be made based on special rates for intercropped areas. These rates should be agreed on with the government.

- The loss of other livelihood sources should be assessed to decide if alternatives are easily accessible, and the time in which the claimant can take these up. If assistance is necessary to re-establish livelihoods from these or other sources it must be registered by type, value and duration of assistance. The calculation of compensation should estimate the period of interruption of the activity and the income derived during that period, in order to decide on the type of assistance and options that may be presented. Options may be cash compensation, employment, or incorporation into an AFWR-driven development activity relevant to the loss incurred by the claimant
- Loss of access to natural resources such as fishing, palm wine making, collecting wild honey, wood fuel, plants for medicinal uses and for construction must be redressed in the choice of resettlement location. No compensation will be provided for the loss of access to plants / trees whose use has been prohibited for conservation reasons, instead assistance will be provided to find other acceptable solutions.
- Loss of income from small businesses located in the wildlife-wilderness zone, will be compensated with the replacement of infrastructure, and compensation for a loss of income during the period of interruption of the business. Affected people may also be prioritized for access to credit if this is their preference, and if they comply with the financial eligibility criteria.
- Loss of cultural property: Although graves sites are considered of significant importance by families and are centres for ritual practices, their social value requires consideration but not necessarily compensation. Historical migrations and the effects of the war have undermined the values associated with these sites in favour of sacred trees and small houses where ancestor spirits are appeased. Compensation for the transfer of individual family or clan sacred areas consists of the transfer of the spiritual home and may require a contribution by AFWR of liquor and food, but these are not considered payments. Other cultural assets such as sacred areas around lakes and forests are considered common clan and community assets. Compensation for loss of use of areas held sacred around lakes and forests is a subject that should be discussed with the local leaders and with the Community Resettlement Committee. If necessary, the Community Trust may also become involved.
- The transitional period before resettlement when food subsidies are required should also be calculated and included into the compensation package. This period is calculated for the period prior to resettlement, through to the first harvest of replanted crops at the resettled site.
- Since food assistance will be provided during the transition period until families are able to reinitiate their livelihood activities, the re-initiation of cultivation and other activities, should be monitored carefully to verify that families are not trying to continue with fake or unnecessary claims for assistance.

- During the transitional period, temporary employment with AFWR may be offered to appropriate members of resettling families as one of the forms of compensation. Such temporary employment would cover the period between cessation of the primary livelihood providing activity, until the family livelihood is re-established. Families benefiting from income from employment might require less food assistance as a result.
- Land areas provided under the land-for-land compensation policy should be of equivalent or better productive potential to the original land cultivated, should be in an area of preference of the people being displaced reasonably close to the original land area, and it should be clearly identified prior to resettlement. If, as will probably be the case, clearing and leveling of the resettled land occurs after resettlement, and this is carried out by each family in an environmentally sensitive way, and in line with the permaculture/organic farming instructions they receive upon settlement, then the total land area to which they will have access should be shown to them prior to resettlement.
- The technical assistance provided initially for women and men to learn about the advantages and techniques of permaculture/organic farming and other methods for improving agricultural productivity should be followed through with outreach provided by trained extensionists who preferably should be a mixture of outsiders trained in communication and extension methods, and local people involved in resettlement. Given the lack of high quality seeds in the Coutada, the resettlement start-up kit should include appropriate seeds for the new forms of agriculture proposed.
- In some instances alternative livelihood options may be offered. Resettling families should have priority access to community development initiatives supported by AFWR for income generation, and skills and knowledge development. This preferential policy also extends to offering employment opportunities.

It should be noted that although all agriculturalists living in the Coutada have been requested to discontinuing burning the vegetation in order to carry out swidden farming, the abandoning of this practice will not be compensated. Instead it is hoped that communities will be able to learn about the sustainable management of their environment as resources become scarcer, and use different methods of managing their land.

Compensation processes

Resettlement planning will require that the area designated for resettlement is identified, demarcated and ceded by host communities prior to resettlement. The customary procedures required for this should be carried out during the period that families are waiting to be resettled. The final spatial plan for resettlement should be designed and approved by the AFWR/Community Resettlement Action Force and local government representatives, in consultation with the Community Trust and any other community structures that may have been established.

The design of new houses should follow those vacated, unless affected families have any particular valid reason to request an alternative.

Compensation payment and assistance procedures

Moving assistance for relocating families should be provided to permit the transfer of all assets to the new settlement site. The household goods and start-up kit indicated above, will be provided to each resettling family

Cash compensation may be paid as a single lump sum, but it is preferable that, in the case of amounts that may locally be regarded as 'large', families are given the option (which will probably not be taken up) of receiving payments in installments. This will permit people to use the money for its intended purpose of re-establishing livelihoods.

STEP 9: NEGOTIATE COMPENSATION

(1) Purpose

The purpose of this step is to negotiate the resettlement compensation to be paid with the families involved, thus ensuring that the principle of fairness is adhered to at all times.

(2) Rationale

The whole resettlement process up to this stage, leads to negotiating a fair compensation with the to-be-resettled families. An offer for compensation to individual families will be based on the evaluated assets, which in turn will have been standardised amongst the to-be-resettled families, and discussed with local governmental institutions, prior to any compensation decisions being taken.

During the negotiation process, which will take place on-site and will entail a standardised document fully specifying the AFWR offer for each set of assets that will be included in the compensation agreement, the negotiation team will include a representative of the local government, probably also a community representative serving on the AFWR/Community Resettlement Task Force, and two knowledgeable individuals representing AFWR (of whom at least one will be a Mozambican). Traditional leaders will be invited to be present during the negotiation process, but this will not be mandatory.

(3) Actions to be taken

After the head of the family has accepted the offer for compensation, the negotiation document will be signed by the representative of the family, by the senior member of AFWR and countersigned by the government representative. The compensation amounts agreed on will be filled in by hand. Resettlement options open to the family will then be discussed (refer to Step 10 below).

STEP 10: RESETTLEMENT OPTIONS

(1) Purpose

The purpose of Step 10 is to ensure that the various resettlement options are made known to the project-affected families, and that satisfactory options are selected.

(2) Rationale and actions to be taken

Project-affected families will be informed of all compensation entitlement options that can help them restore their livelihoods. They should actively select from this options menu the compensation form and method they prefer. If cash compensation is not appropriate in the case of compensation of loss of cultural heritage for example, or the land offered is not sufficient to restore the income of the family, other livelihood options must be made available to them. This may also be the case for people affected by partial economic displacement.

Although there should be no issues as to the availability of enough land for resettlement, it stands to reason that the affected families must be given the opportunity to personally assess the land for themselves, and to liaise with the leaders of the host community. AFWR will facilitate these visits. One or more representatives of the AFWR/Community Resettlement Task Force should also be present.

After selecting the site for their new home, families will, once construction starts, be invited to be involved with the construction process. Information provided at this time should inform them of all options open to them. Thus it should be explained that aside from replacement of housing and land, all families who are resettled will receive:

- technical assistance to explain and demonstrate the advantages of permaculture or organic farming as part of the general compensation package;
- follow-up extension services to assist families to apply and experiment with what they have learned,
- additional support in the form of agricultural extension assistance, or in skills training for small businesses, and
- 250g of maize meal per person per day as a food subsidy for the period in which their main livelihood source is interrupted.
- They will also be informed that the types of projects that will be able to receive support initially will be in the areas of agriculture (permaculture, market gardening, animal production, marketing and sales), small business (literacy, accounts and management) and development promotion (leaning facilitation and communication skills)
- Members of the resettled families who indicate that they would prefer to be employed by AFWR, should be informed that such opportunities may indeed become available, though the numbers will be limited and most of it will be on a temporary employment basis only. Information delivered to all families should note that the option for such employment is made under the condition that they abide by the work norms and that should they, for example, fail to perform adequately, they will lose their job as any other employee would. No promises will be made by AFWR as to the availability of such employment opportunities, however.

It would be useful for AFWR to encourage its own administrative staff to become involved in skill-sharing, and training small business people in the areas of basic accounting and the legal requirements of their activities.

The risk of cash compensation not being used for the purpose it is intended has been mentioned as a critical issue. This will be monitored by the AFWR/Community Resettlement Task Force and families who do not use it for its intended purpose will be earmarked, thus identifying their potential vulnerability. This kind of case is sensitive and will require patience and encouragement to try and involve defaulting families in activities that will guarantee their livelihoods nonetheless. In this sort of situation special attention should be given to women, children and the elderly or handicapped, and if necessary, their participation in specific income generating development activities encouraged. Any compensation that is required for loss of cultural heritage should be dealt with on a case by case basis.

Although host communities are not eligible for compensation for land they cede to resettling families, they are eligible to participate in the community development activities. It will be necessary to identify who constitutes the host community in order to distinguish requests for assistance from them in relation to any others in the Coutada. A simple rule of thumb might be the definition of all those sharing the same resources and services as the resettling community, particularly those who have ceded land for the resettlement program.

(3) Threats

The main threats to the resettlement program not being implemented smoothly are related to its scale. The Coutada 5 project has so many activities being undertaken at once, in difficult conditions, and with a limited number of skilled human resources that providing adequate attention to the resettlement process will tax these significantly. It is therefore important that the AFWR/Community Resettlement Task Force devote sufficient time to these activities, and that at least one member of AFWR staff is made available to cope with the task (see Part L).

STEP 11: EXECUTE THE RAP IN PHASES

(1) Purpose

The purpose of this Step is to ensure that the RAP is executed in an order of priority, and is synchronized with other developments of the Coutada 5 project

(2) Rationale

The establishment of the wildlife-wilderness zone, as well as the overarching objective to rehabilitate Coutada 5 and to restore the severely depleted wildlife resources, will necessitate those people living in the zone to be resettled. Due to the extensive nature of this rehabilitation and restoration process, the development of the wildlife-wilderness zone will need to be phased in over a number of years. It is at this early stage impossible to predict the rate at which the 22 blocks will be developed, but especially the paucity of game elsewhere in Mozambique for relocation purposes to Coutada 5 may lengthen the process. The execution of the RAP will thus

be synchronized with the development and game-proof fencing of the game blocks, and may even, perhaps fortuously, be implemented over a few years.

(3) Actions to be taken

As soon as firm decisions as to the phased development of the 22 game blocks have been taken, AFWR will set the RAP process as described above in motion. This will lessen the impact on AFWR's resources, and will provide enough time to identify and solve the inevitable teething problems. It will also provide time for AFWR to try and enlist donor aid in order to implement the expensive resettlement process.

Such a phased development will, unfortunately, provide an opportunity for opportunists to try and increase the value of their to-be-expropriated property, for example by quickly clearing additional fields for cultivation and building additional structures. AFWR would be powerless to prevent such an eventuality, but will have the results of the social impact assessment process outlined above, to indicate whether the new improvements are genuine, or whether fraudulent forces may be at play. (Refer also to Step 12 below)

STEP 12: INFLUX MANAGEMENT AND CONTROL

(1) Purpose

The purpose of Step 9 is to ensure that the difficulties inherent in the resettling program are not exacerbated by an uncontrolled influx of outsiders to the Coutada, and especially not to the wildlife-wilderness zone.

(2) Rationale and actions to be taken

It could safely be assumed that development activities In Coutada 5, and unfortunately specifically in the wildlife-wilderness zone, will attract outsiders. Although the project reserves the right of admission to the area, in-migration is likely to be a process that is subtle and initiates with the return of family members and extended family members to the Coutada, hoping to obtain access to some of the available development opportunities. The clearing of land and the construction of unnecessary structures by outsiders, may lead to fraudulent claims with regards to resettlement. Community awareness that resources and opportunities are limited and that only *bona fide* Coutada families will form part of the resettlement program, is a useful starting point for community management of any increased stress on services, or loss of opportunities for local people, by the influx of others from outside the area.

The data obtained during the SIA process outlined above, will assist AFWR and specifically the AFWR/Community Resettlement Task Group to objectively control an unwanted influx of outsiders. The implications of increasing population numbers should be shared with the communities as part of the awareness-raising task of the communication strategy (the PCDP; see below.

STEP 13: ESTABLISH AND IMPLEMENT GRIEVANCE PROCEDURES

(1) Purpose

The purpose of Step 13 is to establish procedures whereby resettlement-related community grievances could be satisfactorily addressed.

(2) Rationale and actions to be taken

The need to establish functional and acceptable communication channels for grievances is among the priority issues for the resettlement program. Effective consultation and providing feedback to stakeholder groups in and outside of the project area will continue to build trust and confidence. At present there are probably mixed feelings amongst those people living in the rural areas of Coutada 5 about the project. Most of the people would find it difficult to anticipate whether or not their daily lives may indeed be influenced by the development of the Coutada.

This lack of understanding of what is going to happen and how it will impact on the local communities, is exacerbated by the previous concessionaire's almost total lack of development activities and control. For more than 10 years this lamentable state of affairs may indeed have led to an influx of people from the north to especially the northwestern regions of Coutada 5, as well as to the establishment of settlements along the Rio Repembe.

Whatever the causes may be, it is likely that grievances will arise from the resettlement program. AFWR will have to establish grievance mechanisms and procedures. The AFWR/Community Resettlement Task Force should deal with grievances, bearing in mind that grievance channels must be opened and that grievances should be dealt with speedily and effectively. Grievances may originate directly from the aggrieved party, or it may be channeled through traditional leaders, other local leaders such as the church elders, and even through the local government institutions.

Grievances should preferably be submitted in writing, however if they are not, the AFWR/Community Resettlement Task Force should ensure that the grievance details are recorded in written form. Grievances heard by the AFWR/Community Resettlement Task Group should be followed by a decision on redress, and its communication to the complainant in the timeliest way possible. Information should normally be returned to the community using the same channels as for its initial transmission. However urgent cases should be dealt with directly by the level responsible. The results should be communicated to all other levels at the same time for coordination and awareness purposes.

If the person or community who lodged the complaint is not satisfied with the decision of the AFWR/Community Resettlement Task Force, then as an ultimate recourse he/she/they may submit it to the District Administrator or the Provincial Governor.

STEP 14: ESTABLISH PROCEDURES FOR AND UNDERTAKE MONITORING AND EVALUATION

(1) Purpose

The purpose of Step 14 is to establish procedures for the effective monitoring and evaluation of all the processes and impacts relating to the RAP.

(2) Rationale and actions to be taken

The overall research, monitoring and evaluation (RM&E) strategy for Coutada 5 appears in Part M, and should be read in conjunction with the following M&E strategy for the RAP. In this case the main M&E structure will be the AFWR/Community Resettlement Task Force.

Monitoring should cover both the process and the impacts. Monitoring the implementation process should cover the physical progress of resettlement and rehabilitation activities, and compensation payments. Impact monitoring carried out with community participation would assess the effectiveness of public consultation and participation activities (as elucidated in the PCDP; see below), the use of compensation payments and the sustainability of income restoration and development efforts.

Monitoring provides a means of providing information on progress and learning about problems, so that these may be dealt with as early as possible. Evaluation of impacts in a participatory way is a process that will allow the communities and AFWR to reflect qualitatively, and to analyze their perspective on the effects of the resettlement program on theirs and others' lives.

M&E will be carried out as part of the project implementation process. Regular reporting on progress provides one means of registering process monitoring by the project implementers. Key indicators would be monitored for change. This would mean that qualitative focus group discussions would be used as well as small quantitative surveys to verify particular aspects of the resettlement and development program. AFWR will need to draw up an implementation schedule for the M&E program. The implementation schedule will provide for performance monitoring, impact monitoring and a completion audit.

CHAPTER H2: COMMUNITY DEVELOPMENT PLAN

2.1 PRINCIPLES AND POLICIES FOR THE COMMUNITY DEVELOPMENT PLAN

2.1.1 Guiding principles

The main initial thrust of the Community Development Plan (CDP) will be aimed at the resettling households. The aim will be to ensure that these households are at least as well off as they were before resettlement, and that development initiatives aimed at the restoration of incomes and services are sustainable. Since all existing households will probably remain in the Coutada (indications are that some of the more recent immigrants from the Chibabava and Machaze districts may want to return to their original localities), and will be affected by its rehabilitation to a greater or lesser extent, the target group for the Community Development Plan

(CDP) is initially the resettling households, but ultimately all the households in the Coutada outside of the major towns..

The CDP will thus address issues concerning relocating households and those whose existing economic activities will be displaced. The plan also addresses other groups such as those who are using the area for palm wine making, agriculture and trading.

The approach for community development in the Coutada is based on two main lines of community development thinking: a livelihoods approach on the one hand, and the participatory communication approach that facilitates this on the other.

In terms of the priorities of the rehabilitation project for Coutada 5, three main entry points have been identified:

- Rebuilding the livelihoods of the resettled families;
- Developing a participatory approach to sustainable environmental management, especially in the zones outside of the core wildlife-wilderness area;
- Developing an enabling environment for communities to become more empowered, and to genuinely participate in especially the social programs but to a lesser extent also the biodiversity-management aspects of the Coutada 5 project.

In order to ensure the greatest possibility of success a number of lessons learned in similar programs elsewhere, will be harnessed to guide the CDP for Coutada 5:

- Focusing on skills development among staff (particularly around participatory approaches) before attempting to introduce new livelihood frameworks.
- Ensuring that the introduction of a livelihoods approach is not viewed merely as a centrally driven initiative; the benefits of the approach need to be clear.
- A conceptual framework that is seen to be inclusive of other approaches, and focuses on core community development programming principles, will be used.
- Any implementation framework will be adapted as lessons are learned, so that multiple actors can contribute to the framework evolution.
- By building on successes, using case studies and encouraging those involved in them to promote wider uptake, the scale and impacts of the CDP will be extended.

The concept of dialogue and interpersonal communication will be applied throughout the whole continuum of CDP activities. Introducing a comprehensive communication strategy effectively provides a framework for action, in which existing efforts can be improved through an effective communication approach. It will be the primary vehicle for role change, for participation and stakeholder involvement in successful sustainable livelihoods development. (Refer to the PCDP below)

The practical use of the communication approach in the CDP focuses on four levels:

- The main target group will be the resettled families and the host communities

- Debate and awareness raising involve a cycle of reflection and analysis, followed by participatory decision-making and action.
- Assistance in facilitating people's acquisition of new knowledge and the skills they need.
- Promoting better teamwork and coordination between individuals, organizations and groups involved in the development activities.

Two basic principles that will guide capacity development actions are:

- The need to ensure access to information for all stakeholders in the process;
- The need to strengthen the ability of all stakeholders to articulate, disseminate information and make their own decisions.

The practical process of communication capacity development is based on visual aids, which strengthen the communities' ability to analyze, plan, implement, monitor and evaluate development programs.

In this way a growth in awareness and the creation of solutions to local problems will hopefully develop within the local communities, while technical assistance facilitated by AFWR will be instrumental in ensuring eventual success. The emphasis is on promoting communities' proactive self-help actions rather than their remaining passive bystanders of the Coutada's development process. This paradigm presupposes fundamental changes in attitudes: change agents and technical experts should facilitate and not lead, communities must focus on ensuring effective local leadership and ownership of preparation and planning activities. Strengthening these capacities also creates the conditions for a more sustainable institutionalization of participatory planning methods.

The installation of mechanisms to allow a flow of information between the Coutada management team and the program beneficiaries is a fundamental part of creating an enabling environment for development. Participatory monitoring and evaluation planning should not be too ambitious. The following should be taken into consideration:

- Effective monitoring is only possible if all the participants share the same understanding and commitment in the usefulness of the process and its implications.
- Indicators should include assessment of the quality of the communication and capacity development process that is taking place.
- The team approach in monitoring should support and enhance the aptitudes of participants to learn together and to manage the inherent flexibility of the program.

2.1.2 Ownership of the project

Ownership of the CDP-projects will remain vested in AFWR. Such ownership cannot be delegated to the communities, although that would have been preferable. AFWR's contractual obligations towards the GoM and the fact that 'control' of Coutada 5 is thus, nominally at least, vested in AFWR, forces the company to assume ownership. Accountability to make the CDP

work and responsibility to carry it out rests squarely with the developers. However, this assumption of responsibility by AFWR, does not rule out community involvement. To the contrary, as is pointed out in various chapters in this BBP, the communities will need to be directly involved in matters that may impact on their daily lives. The importance of establishing, strengthening and maintaining community involvement and participation is thus stressed at all levels of the development and implementation of the CDP. The principles of partnership and active participation as embodied in the developmental policy of co-management (collaborative management) as described elsewhere in the BBP will be diligently applied.

2.1.3 Standardising on procedures and processes and lessons learned

The model for the development of affected households in Coutada 5 applies the same basic procedures and processes and shares the same lessons, as the biodiversity and agricultural planning models as discussed above.

The results of many development projects involving local communities in developing countries have been fully chronicled. The successes and failures and the reasons for it are well known, as are the many pitfalls that should be avoided. In the case of Coutada 5 there would thus be no need to reinvent the wheel.

2.2 PRIORITIES AND ACTIONS FOR THE COMMUNITY DEVELOPMENT PLAN

A simple 8-step process, based on the same principles and procedures as the abovementioned biodiversity, agricultural and resettlement plans, will be applied to the implementation of the CDP for Coutada 5. The eight steps will not be discussed in detail.

STEP 1: ESTABLISH AN ORGANISATIONAL FRAMEWORK

Refer to the various plans outlined above. The same structures applicable to especially the RAP will be utilized for the execution of the CDP.

STEP 2: REVIEW OF LEGAL AND POLICY FRAMEWORKS

Refer to the various plans outlined above

STEP 3: IDENTIFY KEY ISSUES

The primary key issues pertaining to the CDP is satisfying the basic premise that the resettled people must not be worse off than before they were resettled, and that the CDP must be perceived by the local communities as an objective, transparent and fair program driven by AFWR to assist with the socio-economic development of all the people occupying Coutada 5.

STEP 4: DETERMINE ELIGIBILITY

Virtually all the people living in Coutada 5, and that includes the townspeople, should be regarded as stakeholders in the development of the Coutada. However, project-affected families would primarily be classified as the resettled families and, to a lesser extent, their host communities. Priority levels for various classes of stakeholders will need to be determined for the CDP activities.

STEP 5: IDENTIFICATION OF COMMUNITY DEVELOPMENT PROJECTS

AFWR, in consultation with the AFWR/Community Resettlement Task Force, must still determine a more detailed list of possible community development projects that should be supported. These include amongst others the establishment of a community development fund, creating employment opportunities, permaculture development, animal production, accounting skills, basic literacy, small business management and game ranch management.

Community Development Fund (CDF)

One of the community development projects mentioned in Step 5 is the establishment of the Community Development Fund (CDF). This fund has not yet been established, but it will be administered according to the following principles and procedures:

i) AFWR will collect all the identified CDF monies on behalf of the Community Trust (see Part L).
ii) The CDF will be controlled and administered by the Community Trust.
iii) The Community Trust will open a bank account in Machanga.
iv) AFWR will assist the Community Trust in formulating a constitution for the CDF, and to determine procedures and safeguards for the allocation of funds.
v) The Community Trust will determine its own priorities for allocating the money. AFWR may, if needed, subtly advise the Community Trust in this regard.
vii) The fund will be administered according to Generally Acceptable Accounting Practices (GAAP). AFWR will provide training and guidance in this regard.
viii) The financial statements will be subject to annual auditing (overseen by AFWR)

Various sources of income have been identified for the CDF. These include but will not be limited to the following:

i) A certain percentage of all the monthly investor levies paid to AFWR (around 7%) will be channeled to the CDF.
ii) Guests at the tourist/hunting lodges and wilderness hiking trails will pay a community levy per night. The rate has not been decided yet, but it will probably be in the vicinity of US $5,00/visitor/night (less for the low-cost hiking safaris).
iii) Once the re-established game populations in the Coutada have reached levels where a sustainable off-take could take place, a significant amount of money could be generated annually by means of a community levy per animal hunted. (See Part K)

STEP 6: ESTABLISH AND IMPLEMENT GRIEVANCE PROCEDURES

Refer to the various plans outlined above

STEP 7: DRAW UP AN IMPLEMENTATION SCHEDULE

Refer to the various plans outlined above

STEP 8: ESTABLISH PROCEDURES FOR AND UNDERTAKE MONITORING AND EVALUATION

Refer to the various plans outlined above

2.1 EXECUTION AND OPERATIONAL PLANNING

The CDP will be primarily be executed by AFWR, in some instances with direct consultation of the Community Trust. The Community Trust will deal independently with some aspects of the plan.

CHAPTER H3: PUBLIC CONSULTATION AND DISCLOSURE PLAN

EXECUTIVE SUMMARY

Effective public consultation and disclosure is a cornerstone of the approach of international institutions, such as the IFC, to the implementation of development projects. The Public Consultation and Disclosure Plan (PCDP) is a program for on-going public (community) consultation and project information disclosure during the construction and operational phases of the Coutada 5 project. In recognition of the importance of the communication process and need to gain buy-in from a large group of local stakeholders, consultation is integral to the implementation of social management plans. The community development approach itself focuses on communication, consultation and feedback provision, making sure that capacity is built for carrying this out adequately. The plan outlined in this PCDP underlines the need to invest resources in this area, given the sensitivity of the project at all levels.

3.1 PRINCIPLES AND POLICIES FOR THE PCDP

3.1.1 Operational context

Public consultation started early on (late 2012) in the project design and planning phase, and led to the signing of the contract between the GoM and AFWR. Since then, however, during the consolidation phase, no formal public meetings have been held, and contact with the communities were more of an incidental nature, rather than planned actions intended to disclose information and to gain insights in community attitudes. AFWR initially concentrated on establishing a visible presence in the Coutada, which led to the successful construction of the first tourist lodge next to the EN1 and the construction of management infrastruture. The absence of a structured public consultation process probably led to rumours floating around, especially amongst the rural communities living in Coutada 5. This shortcoming will as soon as possible be rectified by the implementation of this PCDP.

3.1.2 Ownership

Although the various community committees (the Community Trust, as well as a Community Agricultural Committee, a Community Conservation Committee and the AFWR/Community Resettlement Task Force) will all be involved in the PCDP to channel information, the PCDP will be the responsibility of Coutada 5 management. The communities will thus in effect be the clients, and ownership will rest with AFWR.

3.1.3 Procedures and processes

The structure of the following PCDP model is based on the other plans contained in this BBP.

3.1.4 Lessons learned

The "lessons learned" sections of the biodiversity plans mentioned above, and to a lesser extent also the RAP and CDP, dealt with universally applicable principles and will also be considered when planning, implementing and managing the PCDP.

3.2 MANAGEMENT OBJECTIVES, PRIORITIES AND ACTIONS FOR THE PCDP

A simple 7-step process, based on the same principles and procedures as the abovementioned biodiversity, agricultural, resettlement and development plans, will be applied to the implementation of the PCDP for Coutada 5.

STEP 1: ESTABLISH AN ORGANISATIONAL FRAMEWORK AND IMPLEMENTATION CAPACITY

(1) Purpose

The purpose of Step 1 is to establish responsibility within the organizational framework of Coutada 5, for the implementation of the PCDP.

(2) Rationale and actions to be taken

AFWR initially prioritized the construction of a tourist lodge, with the extensive accompanying management infrastructure to serve as a headquarters facility for Coutada 5. This priority action served to illustrate to all stakeholders the company's determination and ability to invest sizeable sums of money in the project, thus distancing AFWR from the previous concessionaire's almost total lack of development spanning 10 years. Unfortunately, this inevitably led to a postponement of the preparation of a PCDP. Adherence to the guidelines of the following PCDP will ensure that this identified shortcoming will be rectified.

A full-time member of staff will be tasked to deal with all matters pertaining to the local communities, once the various social plans (such as resettlement and community development) is in the process of being implemented. All members of staff (including in-house specialists) who

may be involved with the communication process, will need to be fully conversant with the vision, objectives and plans for Coutada 5, and should preferably have good communication skills. In addition, these people should remain involved in the monitoring and evaluation processes that involve participatory methods.

Provision must be made for the development of visual communication materials, such as PowerPoint presentations, to help community members understand the objectives and activities of the project and their potential roles and the benefits of their involvement.

STEP 2: REVIEW OF REGULATIONS AND REQUIREMENTS AND KEEPING A PCDP HISTORY

(1) Purpose

The purpose of Step 2 is to ensure that the PCDP is prepared and implemented in accordance with relevant Mozambican legislation, regulations and policies.

(2) Rationale and actions to be taken

Environmental impact assessments (EIA) and environmental audits are the key instruments for providing information related to environmental management (Environmental Law 20/97), and by definition also to the public consultation and information process. Decree 76/98 provides the regulations for environmental impact assessment, and whilst Coutada 5 has, as an existing officially protected area no need for a full-blown EIA, the contract with the GoM specifies certain provisos and obligations that AFWR must meet. Public consultation form an integral part of almost all developments in Mozambique which may have a social impact, and the process is implicit in a number of policies applicable to the Coutada 5 development (as was pointed out above). Public consultation is understood to be "the process of listening to the opinions of various sectors of civil society, including corporate or individual persons, directly, indirectly or potentially affected by the proposed activity."

Environmental policies in Mozambique assume that consultation with the affected parties occurs throughout the process of the development of Coutada 5, based on methods appropriate to the context. Project affected communities must be informed in a timely fashion by the project developer of the period and procedures for public consultation, publicity and receiving petitions.

In-house descriptive reports of the public consultation process in Coutada 5 is required, and should specify the diligences undertaken, the participation that took place, questions raised in the debates, submissions and presentations received (if any) and the replies and conclusions drawn. Such reports will be filed by AFWR and will serve as the company's social history.

STEP 3: IDENTIFY ALL STAKEHOLDERS IN THE PCDP PROCESS

(1) Purpose

The purpose of Step 3 is to identify all the stakeholders who should be involved in the execution of the PCDP.

(2) Rationale and actions to be taken

Key stakeholder groups and individuals affected by and/or influencing the outcomes of the Coutada 5 project may be classified in three groups: primary, secondary and external. For the purposes of a rapid analysis the main groups are classified according to their importance and influence in the development dynamic and outcomes of the Coutada's project activities, as follows:

CLASSIFICATION	STAKEHOLDER GROUP
Primary stakeholders The group with direct interests but that possibly perceives itself as having low influence in decision-making processes.	*Primary stakeholders* Communities resident in the rural regions of Coutada 5, as well as project investors
Secondary stakeholders Those involved in the implementation of the project; they are important and influential and are integral to its success	*Secondary stakeholders* The Coutada management staff, any involved NGOs and local government departments/institutions
External stakeholders Those who can be influential to outcomes but have low direct importance to the Coutada project management.	*External stakeholders* Involved NGO's and other lobbying groups and central government, as well as the inhabitants of the major town of Machanga.

The purpose of this method of analysis is to categorize the groups who will have to participate in, or negotiate agreement, on decisions that define the direction of the Coutada's development activities, as well as the approach adopted for their implementation.

Key stakeholder groups can be categorized as seen below, and a very rapid analysis made to show their principal interests or influence over project outcomes. It is the potential conflicts of these interests that form the main management issues that have to be dealt with through consultation and feedback provision. It should also be remembered that a single stakeholder group may also have internal conflicting interests of its own, which must also be managed through consultation, and through an analytical process in which they must prioritise the interests that must be addressed. These are summarized below:

STAKEHOLDER GROUPS	**INTEREST**	**CONSULTATION METHOD**
A PRIMARY STAKEHOLDERS	**A PRIMARY STAKEHOLDERS**	**A PRIMARY STAKEHOLDERS**

Rural communities living in the Coutada 1. Traditional leaders Religious leaders Political leaders 2. Interest groups such as the community committees 3. Traders 4. Relocated families 5. Swidden farming families 6. Coutada staff 7. Women, Youth 8. Elderly and infirm Others 9. Administrative leaders 10. Community court judge (?)	1. Ensuring the well being of community groups from the customary, social, political and religious perspectives. 2. Continued access and use of the biodiversity resources outside of the core wildlife-wilderness zone. 3. Improvement of agricultural and manufactured goods markets and marketing system. 4. Resettlement: obtaining adequate compensation for their losses and re-establishing their livelihoods and social networks. 5. The implementation of improved agricultural methods 6. Opportunities for continued employment and good employment conditions. 7. To become involved in development activities and decision making about their lives, and be recognized by the Coutada so they can set up income-generating projects. They can expect improved access to public and social services. 8. Preservation of lifestyles, daily survival and accessible social services. 9. Obtain support from their government sector to improve their working conditions; increase social	1 Using socio-economic baseline data for qualitative focus discussion groups, and semi-structured interviews. 2 Qualitative monitoring and evaluation using qualitative methods. 3 Adhere to a communication strategy (audience research, feedback, communication campaigns to present information, followed by analytical discussions and decisions about taking up opportunities). 4 Facilitated discussions and meetings with individual families to carry out group and individual planning. 5 Use of local project-specific committees (social development, terrestrial wildlife resource, agricultural resource etc) for communication, joint planning, feedback and grievance channeling. 6 Use communication media to record lessons learned 7 Use committee meetings: Community Trust, project-specific committees (conservation, agriculture, social), AFWR/Community Resettlement Task Force. 8 Meeting minutes will be recorded and reports compiled regularly. 9 Dissemination of reports

	services capacity and quality. 10. Coutada support of local resolution of problems, rather than its resorting to Machanga. 11. Access to social service benefits. 12. Ensuring privacy, collaboration and continued access to resources for tourism purposes.	to Committee participants. 10 In the case of private sector investors communication will be by electronic means and hard copy reporting
B. SECONDARY STAKEHOLDERS 1. Coutada project management 2. Private property investors 3. NGOs and churches 4 District government representatives delegated to the Coutada (AFWR/Community Resettlement Task Force and various other group members, for example wildlife and agricultural teams)	B. SECONDARY STAKEHOLDERS 1. Develop and market a sustainable natural resource-use model, involving a complementary community development program that supports the commercial development initiatives and co-conservation management. 2. Elucidate on the value for money in tourism opportunities, enjoyment and participation in scientific monitoring for relevant conservation management models. 3. Pursue the development of investments in Coutada 5 to support the local communities. Also ensure that opportunities for increased participation in community development initiatives are created 4. Defense of the interests of AFWR and the local government with reference to justice in compensation, resettlement, and	B. SECONDARY STAKEHOLDERS 1 AFWR/Community Resettlement Task Group meetings, minutes and dissemination of these among participants. 2 Annual progress and financial reports provided to all primary and secondary stakeholders 3 Various project-specific committee and/or Task Force meetings, minutes and dissemination of these to participants.

	employment as well as ensuring relevant improvements in access to public and social services.	
EXTERNAL STAKEHOLDERS 1. District government and District Administrator District Labor office 2. Provincial government and Provincial Governor 3. Central government and applicable programs Ministry for Coordination of Environmental Affairs Coastal Marine and Biodiversity Management Project – MICOA Ministry of Agriculture and Rural Development Ministry of Tourism Ministry of Labor National Directorate of Health, Ministry of Health Ministry of Education National Directorate of Water Affairs, Ministry of Public Works and Housing 4. Any conservation NGOs who may be regarded as external stakeholders: World Wildlife Fund Endangered Wildlife Trust IUCN 5. Private sector and individuals of influence.	EXTERNAL STAKEHOLDERS 1. Ensure that regulations are followed and that opportunities for employment etc. are in line with AFWR policies 2. Compliance with laws, regulations, and the provincial development strategy. 3. Raising income in the province from private sector investments. 4. Increasing conservation coverage. 5. Socio-economic gains for the Coutada 5 communities. 6. Compliance with laws, regulations and policies. 7. Sharing of lessons with other parts of the country. 8. Monitoring this initiative as a model of its kind, learning from successes and failures elsewhere. 4. Coordination and collaboration to learn from similar ventures and gain in the aim of conservation by sharing similar premises and pooling protection resources. 5. Play a watchdog function in compliance with local, national and international standards.	EXTERNAL STAKEHOLDERS 1 Compile and provide annual progress and financial reports 2 Employ community approved visual and audio media records, for sharing with stakeholders and for fund raising for community identified projects. 3 Use communication media to share local lessons learned with external stakeholders

6. Donors	6. Development of a private/public model for conservation management in this part of the world. 7. Stimulate conservation interest based on biodiversity. 8. Stimulate interest in ensuring compliance with international standards.	

STEP 4: IDENTIFY AND DEFINE THE PUBLIC CONSULTATION AND DISCLOSURE PROGRAM AND PROCESS

(1) Purpose

The purpose of Step 4 is to identify the contents of and define the public consultation and disclosure program and process.

(2) Rationale and actions to be taken

Social management program

The public consultation and disclosure process that will take place in the course of implementation of the project's social management program, is an integral part of the implementation of the component. The activities outlined below are therefore detailed and involve local capacity building to make communication and public consultation or participation the backbone of the community development program. The PCDP outlined below and in this Chapter, concentrates on social and/or community development aspects. Similar outlines need to be drawn up for the other development and management plans dealt with elsewhere in the BBP (see reference to the terrestrial wildlife and agricultural management program below)

Implementation Activities	**Public Consultation and Disclosure Activities (Community Level)**
A. Community Capacity Development and Communication Program Design a communication strategy Develop materials to implement the strategy Appoint a PCDP-execution member of staff Design and implement a facilitation and communications training and capacity development program Design and implement monitoring systems	1 Audience research – consult all community stakeholder groups on what people know, how they hear it and assess what they need to know and how. 2 Undertake field testing of materials to verify the effectiveness of messages. 3 Train the PCDP facilitator (if necessary) in person-to-person communication methods, use of media, community

Produce quarterly, six monthly and annual reports for AFWR Carry out external evaluations	capacity development and group facilitation techniques 4 Design monitoring systems in a participatory manner; where possible use visual or audio media to record events and opinions, to share with others in other parts of Coutada 5 at a later date. 5 Distribute annual PCDP reports to all stakeholders 6 Distribute annual PCDP evaluation reports to all stakeholders 7 Share community-approved visual and audio testimonials of local situations and development processes with stakeholders.
B. Resettlement actions	
Complete SIA and community census Establish the AFWR/Community Resettlement Task group Implement the RAP, including: ▪ Demarcate settlement land with the host communities ▪ Verify the project-affected people and raise awareness about the process of resettlement ▪ Complete assets inventories ▪ Establish a grievance communication and redress system ▪ Help families choose settlement sites and agricultural land areas ▪ Complete the resettlement housing & related infrastructure ▪ Pay compensation ▪ Train new settlers in permaculture/organic farming ▪ Assist in the re-initiation of principal & alternative livelihood activities ▪ Adapt and refine the resettlement program in response to monitoring and evaluation reports	Undertake individual consultation with the new 'landowners'; use participatory methods to identify boundaries and map these, and verify (if any) customary processes of decision-making for land cedence for resettlement. Consultation at family and group levels with project affected people; raise awareness about the resettlement process and the objectives of the project. The communication campaign should include information about the objectives and activities of the project, the resettlement process and the grievance communication mechanisms Consultation should continue at family and group levels to verify grievances (if any) and to monitor progress until all compensation and rights are met in respect of resettling families Build the capacity of the AFWR/ Community Resettlement Task Force , the PCDP-implementing officer and of the AFWR-community in the use of communication methods, the identification of monitoring indicators, counseling, managing information and monitoring. Involve district and local government

	officials in progress and impact monitoring
	Regularly monitor status of settlers through consultation.
C. Community Livelihood Development Activities	
Carry out the communication campaign in specific priority locations	Publicize the opportunities available to communities via the communication campaign. Explain available options, conditions for applying, procedures for applying and who to contact.
Receive project requests (if any)	
Assist in preparing project proposals	
Approve project proposals and initiate their operation (if approved)	
Train interested farmers in permaculture	Explain the overall rationale for community development and an agricultural project; use the communication campaign to project images of potential results.
Employ local people in the Coutada 5 project	
Support market gardening / animal production initiatives	
Support the development of a marketing system for agricultural produce	Invite discussion groups to identify problems and analyze best ways of resolving these
Train traders and others in accounting	
Provide support to literacy groups	
Initiate small business management training	
Design and implement a facilitation and communications training and capacity development program	Use communication media to record lessons learned and use the AFWR/Community Resettlement Task Force and the PCDP-implementing officer to share these with other stakeholders so they can learn from each other.
Carry out conservation and agricultural management training and education	Develop educational materials about conservation and sustainable natural resource management and use.
Adapt and refine the community development program (CDP) in response to monitoring and evaluation reports	Use community-approved visual and audio media records for sharing with stakeholders and for fund raising for community identified projects.
Respond to grievances within the stipulated time	

Biodiversity and agricultural utilization and management plans

The social management program outlined above include peripheral reference to other plans and/or activities that are not directly related to the RAP and the CDP, but does not deal in any detail with the multitude of impacts emanating from the management/utilization plans for biodiversity/terrestrial wildlife resources and agriculture dealt with elsewhere in the BBP (see Part D). Specific implementation activities for these projects as well as the concomitant public consultation and disclosure activities need to be identified (in Operational Plan format; see below) and added to the social management program outlined above. Separate PCDP's may be prepared for each of these projects, but it will probably be decided to rather prepare a single PCDP document for the whole Coutada 5 project.

Public consultation with stakeholders outside of Coutada 5 at local, provincial, national and international levels will be carried out as necessary. Recognizing that consultation and information disclosure is a key means of gaining support for the development of the project, it should be prioritized and enough resources allocated.

STEP 5: DRAW UP A PCDP IMPLEMENTATION SCHEDULE

(1) Purpose

The purpose of Step 5 is to draw up an implementation schedule to give effect to the PCDP.

(2) Rationale and actions to be taken

The effective implementation of the comprehensive PCDP would be dependent on the preparation of an implementation schedule. Published data of implementation schedules for other projects may serve as examples for the Coutada 5 schedule, which will not be provided here.

STEP 6: ESTABLISH AND IMPLEMENT GRIEVANCE PROCEDURES

(1) Purpose

The purpose of Step 6 is to establish and implement effective procedures and mechanisms to deal with community grievances.

(2) Rationale and actions to be taken

The need to establish functional and acceptable communication channels for grievances is among the priority issues for the overall community involvement program. The need for consultation with stakeholder groups in and outside of the project area from the earliest moment possible is an excellent way of building trust and confidence. Indications are that the communities living in Coutada 5 may regard the project with suspicion. Should this indeed be the case, it may be the result of a lack of reliable information filtering down to the local community levels, as well as a possible wait-and-see attitude that arose due to the previous concessionaire's lack of meaningful contact with the people.

Communication channels should facilitate the passage of information to the appropriate people in a timely fashion, even if they have diverse origins. In recognition of the diversity of origins of grievances, the grievance communication channels should first be identified in terms of who will be able to use them.

The grievance address mechanisms employed by other similar projects, will serve as examples to AFWR. The following principles and grievance address mechanisms will be applied:

- The channels of best potential for the transmission and address of grievances must be identified and applied. Religious leaders may provide a useful link between the community and the AFWR/Community Resettlement Task Force.

- The grievance redress mechanism and procedures outlined above for the CDP would also apply *situ situ* for the PCDP

Using the above principles as a guide, grievance redress mechanisms for Coutada 5 will meet with the following requirements:

- The AFWR implementing officer for the PCDP will be available as the first locality for the lodging of grievances. Such grievances will be accepted in writing, or the officer will record a verbal grievance in writing. The officer may resolve the grievance on his/her own, but more serious complaints/grievances will be referred to the AFWR/Community Resettlement Task Force in writing.
- The grievance may also be submitted via other channels of the complainant's choice, for example religious leaders, traditional leaders, the Community Trust or also the Coutada Community Agricultural Committee or the Coutada Community Conservation Committee
- Grievances heard in the AFWR/Community Resettlement Task Force meetings, will be followed by a decision on redress and its communication to the complainant in the timeliest way possible. Information should normally be returned to the community using the same channels as for its initial transmission. However urgent cases should be dealt with directly by the level responsible. The results should be communicated to all other levels at the same time for coordination and awareness purposes.
- Responses to grievances should have an established time limit (such as 20 days from the date of presentation), within which the Coutada 5 management guarantees a response / action. This sort of approach will promote greater trust in the communication system, and will improve attitudes about the project within the community.
- If the person or community who lodged the complaint is not satisfied with the decision of the AFWR/Community Resettlement Task Force, then as an ultimate recourse he/she/they may submit it to the District Administrator or the Provincial Governor.
- The same channels used to address formal grievances, should also be encouraged to address informal problems and conflicts so that the causes of grievance are mitigated. The emphasis in these cases should however be on the solution of the problems at local level, beginning with the complainants themselves.

STEP 7: ESTABLISH FEEDBACK CHANNELS

(1) Purpose

The purpose of Step 7 is to establish proper and effective feedback channels to disseminate information.

(2) Rationale and actions to be taken

Results and feedback from public consultation and information disclosure at community level will be reported according to the following scheme:

A: Inputs to audience research activities will be reflected in the messages produced for

Community Capacity Development and Communication Program	the communication campaigns. All monitoring information will be included in quarterly and annual reports. Adaptations to the programs as a result of feedback from monitoring will also be monitored, and reported on. Reports on all grievances reported and/or not redressed will be included in the quarterly and annual reports. Feedback from external stakeholders on the contents of annual reports, annual evaluation reports and audio-visual reports on project activities will be provided directly through a meeting at District level with district level stakeholders, and through individual meetings and any written feedback from provincial and national levels. Annual stakeholder meetings should be held at District level to provide a forum for feedback that includes the most directly affected stakeholders. Reports of annual stakeholders meetings will be circulated within 15 days of the conclusion of the meeting. Each annual report should include a compilation of all feedback provided during the year from stakeholders at all levels. The report will address the activities undertaken in response to this feedback.
B. Resettlement Program	Feedback from all participatory planning activities carried out with respect to the resettlement program will be recorded in the quarterly and annual resettlement reports provided by all levels of staff directly involved in the program. District government participation in resettlement management, implementation and monitoring structures will permit the recording and circulation of reports at district government level of the consultation and feedback activities taking place in Coutada 5
C. Community Livelihoods Development Program	Feedback following the communication campaign will be recorded together with the whole consultation process ensuing from initial project requests and the quarterly and annual project reports. Feedback from sharing audio-visual records of lessons learned inside Coutada 5 will be recorded in the normal project reporting process. These materials may be circulated among external stakeholders and other interested agencies. Their feedback will be reported in quarterly and annual project reports.

3.3 RECORD OF COMMUNITY CONSULTATION/CONTACT

A detailed record of all community consultation and/or contacts will be kept by AFWR. Most of the data will be stored electronically, but hard copies of reports will be filed. In addition, a hardcover file noting all the contacts will be kept by the AFWR officer responsible for the implementation of the PCDP

PART I: TOURISM DEVELOPMENT

CHAPTER I1: INTRODUCTION AND BACKGROUND

Interdependency between conservation, utilization and benefit sharing has been established from the onset of the Coutada 5 project. The commercial activities that will take place on the Coutada should pave and pay the way for the conservation of the biodiversity resources, whilst at the same time being totally dependent on maintaining (or establishing in certain respects) a healthy environment and the goodwill and support of the local communities. It also stands to reason that the commercial development of Coutada 5 may impact in a number of ways on the environment on which it depends. Tourism and tourism-related activities are thus inseparable from the biodiversity resources.

The general primary and secondary objectives for sustainable ecotourism development in the Coutada can be summarized as follows:

> "The primary objective of sustainable ecotourism development is to develop ecotourism facilities and activities within the Coutada that are both sensitive to a biodiversity-rich ecosystem and beneficial to the conservation of the ecosystem, as well as forming a basis for financial self-sustainability. A secondary objective is to assist in ensuring that the rapidly expanding ecotourism developments in the northern areas of Mozambique are also environmentally sustainable."

More specifically, the tourism development objectives can be defined as follows:

- To develop a biodiversity friendly strategic tourism development plan which will establish a set of principles, frameworks and mechanisms on which the ecotourism development will be based;
- To review tourism-based current and prospective community benefit-sharing and make recommendations for its maximization.

However, it is important that everybody concerned realize that Coutada 5 is a long distance destination from the major tourism markets, such as South Africa, Europe, the Americas and the East. Just as important is the fact that the Coutada currently prevails over a very limited tourism product. Initially the tourism product will be limited to a few exclusive wilderness experiences, such as wilderness trails, hiking the Save, dhow and 4x4 trips and exploring the coastal mangroves.

Other aspects that will influence the initial tourism development negatively, are the distance from the nearest international airport (Vilanculos; 200 km), the condition of roads traveling to and from Vilanculos, the political safety situation especially north of Rio Save and the hazardous visa requirements from some source tourism countries.

For the time being it should be accepted that the tourism product will be limited to safari hunting (which in turn will be dependent on a successful wildlife re-introduction program), roadside accommodation and a few wilderness trails. It can also be accepted that the tourist profile will in all likelihood reflect a relative wealthy and older (30 to 50 year) age bracket - they are tourists with limited time available and who prefer to travel in small groups.

In time the product will be extended to include safari hunting, game viewing safaris and a wilderness experience in the open. However, this will depend on how, when and where, and how successful, wilderness and game areas will be established.

CHAPTER I2: SUSTAINABLE TOURISM DEVELOPMENT PROGRAM

The sustainable tourism development program is presented in four modules as follows:

MODULE 1: A SUSTAINABLE TOURISM DEVELOPMENT PLAN FOR COUTADA 5

1.1 PRINCIPLES AND POLICIES: THE TOURISM-BIODIVERSITY LINKAGE

(1) Tourism in the Coutada

The ecotourism facilities in the Coutada will be a high quality - low density - low impact - high value - safari style development. The concession contract allows at this stage for a total of 10 double roadside accommodation chalets, a restaurant, 22 investor game blocks - each with the potential that tourism facilities can be created – and facilities to conduct wilderness type of activities.

(2) The biodiversity context

The developmental and utilization policy of the Coutada, and thus also the tourism development, is in line with the triple-bottom-line business approach of the Convention on Biological Diversity (CBD) (1992) namely the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits.

A key concern for the Coutada development therefore is the appropriate interaction between biodiversity conservation planning and tourism planning, although limited, and development (as reflected in this BBP).

1.1.1 Developmental context and strategic framework

(1) Business Biotools

The Kijani Trust is a joint initiative of the IUCN and the IFC to develop and invest in biodiversity business in Africa, and has developed the Kijani Business Biotools. These innovative tools provide guidance in the development of a biodiversity business, and will be used to facilitate the planning and development of ecotourism in the Coutada.

(2) Mission and objectives

The mission statement for the Coutada contains the three component parts of the CBD (see above) and can thus be an effective tool for the management of tourism and biodiversity and for ensuring poverty alleviation.

1.1.2 Evaluating the key issues, dilemmas and sensitive areas

Evaluation identifies critical areas for examination and considers the likely impact of the proposed project.

(1) Biodiversity and Conservation (BD&C)

Issue: Consistency with National Plans, Policies and Regulations

The development of Coutada 5 is consistent with national plans, policies, regulations and relevant laws of Mozambique.

Issue: Awareness of, and collaboration with, other actors in the field of biodiversity and tourism

The current weak ties with other tourism and biodiversity enterprises and role-players need to be strengthened.

Issue: Consistency with the key biodiversity priorities found within the bio-neighborhood

Coutada 5 needs to give the ”big picture” of how it fits into the region. The feasibility of a bio-neighborhood map will be investigated, showing the project area, the wider bio-neighborhood and the other actors involved in BD&C.

(2) Economically Sustainable Use (ESU)

Issue: Government support and consistency with national tourism and regional planning policies

The target objective, pertinent to Coutada 5, of the National Policy and Strategy of Tourism is to contribute to the rehabilitation, conservation and protection of natural resources and man-built property, especially those of ecological and historical value and to add value to the cultural property

Issue: Project viability and market assessment, in the light of existing networks and facilities

Coutada 5 is operating in the light of a realistic understanding of the market and the potential demand (although AFWR has not yet undertaken a full assessment).

(3) Social Benefit Sharing and Responsibility (SBSR)

This topic is further dealt with below, and in the Sustainable Tourism Development Plan (STDP.

1. 2: MANAGEMENT OBJECTIVES, PRIORITIES AND ACTIONS FOR THE SUSTAINABLE TOURISM DEVELOPMENT PLAN

A simple 9-strategy process roughly based on the same principles and procedures as the other strategic plans discussed above, will be applied to the implementation of the Strategic Tourism Development Plan (STDP) for Coutada 5.

Strategy 1:	Prepare internal and external (if required) EIA's of any future developments
Strategy 2:	Assessment of key impacts of tourist visitation to Coutada 5 and determining acceptable levels of tourist use (inventory of tourism attractions; map of attractions and activities; ecotourism carrying capacity)
Strategy 3:	Apply the zoning plan to tourism development and management
Strategy 4:	Identify performance indicators
Strategy 5:	Collaborate with other role-players in the fields of biodiversity and tourism, and contribute to existing regional and national frameworks
Strategy 6:	Establish and implement codes of conduct
Strategy 7:	Community development, participation, capacity-building and consultation
Strategy 8:	Sustainable use of resources
Strategy 9:	Tourism-related community/social issues

Application of the nine-point plan:

The implementation of a number of the strategies outlined above, will be dependent on detailed **Operational Plans being prepared**. Some of the strategies will thus only be very briefly discussed below:

Strategy 2: Assessment of key impacts of tourist visitation to Coutada 5 and determining acceptable levels of tourist use (inventory of tourism attractions; map of attractions and activities; ecotourism carrying capacity)

The determining of a future ecotourism carrying capacity assessment for Coutada will be vital in order to ascertain "the maximum intensity of use that a tourism site can sustain without undergoing unacceptable physical or biological deterioration and without causing appreciable impairment of the tourist experience or cultural well-being of host communities at a given level of management" (IFC/GEF 2002 guidelines, with respect to the Komodo National Park in Indonesia).

The establishment of maximum allowable visitor/participant numbers in a range of activities is important for the biophysical and socio-cultural well being of the Coutada project, not simply a qualitative discussion of impacts. Whilst the tourist numbers for the near future will probably be far below the actual carrying capacity for tourists, at full development the situation will have to be carefully controlled. Notwithstanding the large area (210 000 ha) of the proposed core wildlife-wilderness zone, which will undoubtedly be the main tourist attraction in the future, the numbers of both consumptive and non-consumptive tourists may exceed the norms if allowed to increase unchecked. Each of the 22 private game-block investors will probably bring in guests/tourists, and the majority (if not all) of them will primarily cater for consumptive tourists. The number of hunters, or

hunting parties, which can be accommodated at any one time, will need to be strictly controlled by AFWR management.

Strategy 3: Apply the zoning plan to tourism development and management

The zoning plan for Coutada 5, as outlined above, will be the principal method to deploy visitors, and embodies mainly the strategy of concentrating tourism development and thus also visitor use to restricted areas, in this case primarily the core wildlife-wilderness zone. It was designed to allocate geographical areas for specific levels and intensities of human activities and of conservation. Though the core wildlife-wilderness zone will be the mainstay for tourist activities, opportunities to use the other zones for tourist usage will be exploited. However, non-adherence to the zoning plan for tourism purposes will inevitably lead to unacceptable biophysical and/or socio-cultural impacts

Monitoring (systematic observation) will be required as an instrument to detect tourism-induced changes over time, attributable to the operation of the tourism facilities or activitities.

Strategy 5: Collaborate with other local and/or regional role-players in the fields of biodiversity and tourism, and contribute to existing regional and national frameworks

The need for Coutada 5 to establish links with and to become part of the greater regional picture has already been stressed elsewhere in the BBP (refer to the discussion on public-private partnerships and on collaboration). This principle does not only apply to biodiversity aspects (for example collaboration on wildlife matters) but equally so to tourism. The southern regions of Sofala province, including Coutada 5, currently offer almost no incentives for tourists to visit the region. Close collaboration with the adjoining Coutada 4 and Zinave National Park, to the immediate south of the Rio Save opposite Coutada 4, may collectively open new possibilities for tourism.

This aspect is dealt with more fully in Module 2 of the sustainable tourism development program below.

Planning: One or more Operational Plans dealing with the tourism plan will need to be prepared

MODULE 2: INSTITUTIONAL DEVELOPMENT IN THE TOURISM SECTOR IN THE VILANCULOS/INHASSORO/COUTADA 5/ZINAVE NATIONAL PARK AREA

2.1 BACKGROUND

The government of Mozambique considers tourism to be a priority area in the current process of economic recovery, minimizing of poverty and general development, and has taken a number of actions to further the important role of tourism.

2.2 REVIEW OF THE LOCAL AND NATIONAL TOURISM SECTORS

The National Policy and Strategy of Tourism recognizes that tourism should remain an activity of essentially private sector initiatives, and that it should contribute to a better quality of life for the Mozambican population, to equitable development of the country and to the rehabilitation, conservation and protection of natural and man-built property, especially that of ecological and historical value and to add to the cultural property. The Coutada 5 Zone is seen as an important zone for short-term exploration, and for meeting these governmental objectives.

2.3 RECOMMENDATIONS

The following shortcomings have been identified at a national level and may be followed up with the relevant authorities:

- Effective inter-sectoral mechanisms that will ensure the harmonious interaction among all stakeholders and a symbiotic linkage between biodiversity conservation planning and tourism planning and development need to be developed. Such inter-sectoral mechanisms are currently absent in southern Sofala
- The promotion of inter-sectoral linkages is seen as crucial.
- A body for co-coordinating interaction between biodiversity and tourism need to be created**.**

Furthermore, the organization should consider accepting and applying universal *Codes of Conduct* (see Module 4 below) as one of the means towards developing an effective tourism impact managing strategy for the region.

A cross-sectoral effort is needed in Coutada 5 to ensure effective law-enforcement on critical biodiversity issues such as the illegal practice of logging, illegal hunting and the indiscriminate use of gill nets in fishing. .

Tourism in the area would benefit from the development of an inventory of regional ecotourism attractions (highlighting for example the threatened biodiversity of the region), and safety aspects of tourism need to be addressed as emergency medical care, etc. are lacking.

MODULE 3: CODES OF PRACTICE

3.1 PRINCIPLES AND POLICIES

Indirect strategies for managing tourist impact are those that aim to modify the behaviour of visitors. One of the management tools that may be used to reduce the impacts arising from tourism is getting the tourists to adhere to codes of conduct. Tourists are often enjoined to “leave only footprints.” Codes of practice and conduct provide a mechanism for achieving this in Coutada 5.

A comprehensive Coutada 5 tourism code, based on best practice, will be compiled especially for Coutada 5, and should to be adapted with stakeholder participation in due course.

3.2 CODES OF CONDUCT

The Coutada 5 codes of conduct will provide guidelines for visitors to the lodges, wilderness areas and individual game blocks, inclusive of the owners of the facilities, and will need to be compiled.

Planning: An Operational Plan providing a tourism Code of Conduct will be prepared in due course

MODULE 4: INTERPRETATION PROGRAM

4.1 INTERPRETATION CENTRE

Most if not all the visitors to the Coutada 5 will welcome the opportunity to learn more about the biodiversity, cultural history and social dynamics of the Coutada. An interpretation centre is notoriously difficult and expensive to manage, maintain and upgrade, but it is nevertheless recommended that a very basic interpretation centre should be established at the lodge as a means of educating visitors and staff about the diversity of the area.

Before any development action is taken, a **feasibility study** to determine the need, viability, development costs and operational expenses of an interpretation centre will be undertaken.

4.2 FIELD GUIDE

It will be highly beneficial to the management and appreciation of Coutada 5 by visitors and staff, for an illustrated field guide to be produced on the highly interesting ecology of the Coutada. This field guide could begin modestly as a monochrome pamphlet and could eventually build up to become a substantial tome. A **feasibility study** will be undertaken prior to an implementation decision being taken.

4.3 INFORMATION BOARDS

Information boards are commonly erected in conservation areas around the world. Such boards could be erected at key locations (eg the lodge) in the Coutada to inform people about the most important ecological characteristics of an area.

PART J: CONSERVATION INITIATED OPPORTUNITIES

CHAPTER J1: INTRODUCTION

The eventual success of the Coutada 5 development will ultimately be decided by its sustainability: both ecologically and economically. Conservation, to be successful, has to pay its own way. This principle, which is accepted as the standard in modern conservation practices, especially in developing countries such as Mozambique, can only be adhered to if the major role-players eventually benefit from the project - the private sector with their specific requirements, as well as the local community with their needs.

The sustainable use of the natural resources of the area, the identification of opportunities created from tourism and game block developments and the consumptive and non-consumptive utilization practices in the Coutada, will need to be integrated. The impact that the Coutada development will have on the local community will be far-reaching in many respects. They certainly have certain project-related expectations, regardless of whether these expectations are realistic or justifiable. A lot has already been said and published about 'conservation incentives', but unfortunately incentives can easily be understood and expected by the community as 'hand-outs'. For this reason preference is given to the term 'conservation initiated opportunities' rather than the more commonly used term 'conservation incentives'.

The conservation action that is focused on the wildlife component, will probably have the biggest influence and disruptive effect on the local community. The presence of potentially dangerous animals, the cessation of slash-and-burn agricultural practices, the limitation on freehold grazing rights, restriction of illegal logging operations, curtailing of (illegal) hunting in the core wildlife-wilderness block and elsewhere, restricted freedom of movement and access to food sources, and the inevitable resettlement of households are but a few of these influences. However, this component will generate the biggest benefit to the community, especially job creation at the operations level.

A specific directive approach to especially wildlife management is required to ensure that the community will eventually benefit as planned. The two major role-players and interest groups in the Coutada that are most directly affected by any development decisions, are the private sector developers and the local community. The private sector is the driving force behind the development, and the local community is basically the affected party that should benefit to an extent from the development. It must be accepted that a conflict of interests between the two major groups do exist. This conflict can be to the detriment of the development if not correctly managed.

CHAPTER J2: OBLIGATED COMPENSATION FOR THE COMMUNITY

At this stage there is no certainty about the number of people that reside within the boundaries of the Coutada. This uncertainty unfortunately applies primarily to the area of greatest concern for AFWR, namely the planned core wildlife-wilderness zone. A study to determine the exact number of people, their main income sources and the extent of their livelihood activities is in the process of execution. The survey concentrates on the planned core wildlife-wilderness area.

The developments in the Coutada will impact to a great extent on certain segments of the local community - as a matter of fact, to such an extent that their whole lives, lifestyle and livelihood will change. This applies specifically to those living in the planned core wildlife-wilderness area. This effect should not necessarily have to be to their disadvantage and can be changed to their advantage. Permanent employment in the Coutada can, to a great extent, be seen as a antipode for any sacrifices that the local community will have to make - as a matter of fact, most of the locals may prefer the permanent employment above risky subsistence agricultural activities.

However, one must accept that the community will have to make sacrifices. The freedom of movement for some of them will be limited, their agricultural practices in the core wildlife-wilderness area will have to be terminated, some of them will have to be resettled and their traditional way of earning a living may even be jeopardised. For this, and for the use of their land, a fully negotiated agreement will have to be reached (Refer to the Resettlement Action Plan)

In order not to re-invent the wheel, and also to avoid making the same mistakes others have made, a page should be taken from the lessons learnt at Benguerua Island (due south of Coutada 5, to the east of Vilanculos). A Community Trust Fund has been established for the 188 families resident on the island. The sacrifice the community had to make, was partially compensated for by those who benefited from the sacrifice: the tourists and the lodges. This trust is therefore funded through a levy imposed on tourists who stay at the lodges on the island, based on a fee per bed-night. The lodges provide the administrative and logistical support to the fund, but the fund is controlled by a committee on which the community is well represented. Conservation is encouraged to enhance the product (the environment) which enable the tourism activity, and therefore also the generation of the funds. A similar fund will be established in Coutada 5 (as discussed above).

Subsistence agriculture has for some of the local peoples' lives been part of their history, traditions, culture and way of living. Due to the uniform agricultural potential of the bigger area, resettlement away from their current locations of choice should not negatively impact on their livelihood. In addition, the smallholder farmers will be assisted to revert to more modern organic farming systems.

CHAPTER J3: CONSERVATION INITIATED OPPORTUNITIES

3.1. GENERAL

The conservation-initiated opportunities (CIO) resulting from developments and other Coutada initiatives, can basically be classified into three groups:

- Lifestyle opportunities due to increased (economical) activities in the area
- Opportunities that originate from the development of tourist facilities, lodges and the tourism activities related to it
- Opportunities that derive from the development of the game investor blocks and wilderness area.

However, the benefits that derive from the above, are inter-linked and a clear distinction between them cannot be drawn. The benefits identified and discussed in this BBP are by

no means exhaustive and new incentives should constantly be developed and added. It must also be stressed that it is almost impossible to estimate the input required to establish and implement CIO's, as well as to calculate the impact of such opportunities on the lives of the local people. Figures supplied in this regard (see below), should therefore be regarded as guidelines only.

3.2 LIFESTYLE OPPORTUNITIES

These lifestyle opportunities, at this stage still basically limited to employment opportunities, have at this early stage of development already made a real difference to the lives of the local people. However, quantifying lifestyle opportunities and the impact they have made on the people, is not possible.

3.3 OPPORTUNITIES ORIGINATING FROM TOURISM ACTIVITIES

The development of tourism facilities, and especially the lodge near the EN1, have already contributed, and will in future contribute, to the upliftment and prosperity of the local community. Pieters estimated that 2,7 direct employment opportunities at remote eco-tourism destinations are created by tourist facilities, for every one tourist they can accommodate, and that as many as nine individuals will benefit if the incentives flowing from such visits are to be optimized. [Based on the above, employment figures at the lodge can be expected to number between 27 and 54, and a total of up to 180 individuals can be expected to benefit from the lodge]. Direct employment opportunities in the Coutada is expected to be even higher due to the remoteness of the area, the non-existence of modern supply channels and service providers, as well as the fact that even more people will have to be employed due to the present unskilled nature of the local labor force. Zaayman has calculated the multiplying effect of tourism expenditure at 1½, which implies that the accumulating and ripple effect of the money spent by tourists are much higher than the actual expenditure.

3.3.1 Construction phase

In order to optimize the benefits to the community during the construction phase of tourism facilities and the investor game blocks in Coutada 5, as well as the agricultural/cattle ranches, priority will be given to the usage of local material and local labor. The usage of local material creates many indirect employment opportunities, and prevents the drainage of invested currency. It is estimated, based on South African standards and prices, that as much as 72% of the total investment on construction of tourism facilities, is spent in Mozambique and is not subject to further currency drainage. Furthermore, it is estimated that labor costs forms about 35% of total construction costs. This is obviously a direct benefit to the local Mozambican citizens who are employed by AFWR.

The usage of local material ensures a larger spending in Mozambique, and more specifically in the Coutada region. The collection of wood, grass, reeds and jeka initiates business opportunities for local people; the same with the cutting and trimming of local wood required for construction.

3.3.2 Operational phase

(1) Direct employment opportunities

It was already mentioned that the capacity for one tourist creates as many as 2,7 permanent employment opportunities and, if correctly directed, as many as nine indirect employment opportunities. The impact of these employment opportunities on the local people must be seen in the context of the basically non-existence of opportunities prior to the development of the Coutada, including the investor game blocks and the cattle ranches. The current prescribed monthly minimum wage payable to a full-time employee in Mozambique amounts to approximately US $110. This implies that a huge benefit will be derived from direct employment opportunities for the community.

(2) Indirect employment opportunities

Indirect employment opportunities are normally associated with the rendering of services by entrepreneurs to tourist operations and business enterprises (lodges, investor game blocks, etc), and to tourists themselves.

(3) Entrepreneurial opportunities

Once the Coutada has been developed as planned, many opportunities will exist for local people to use their entrepreneurial skills and start a small business. A major drawback would probably be the lack of capital, which will present a tremendous obstacle for local people to enter the business world. However, if this drawback can be overcome, huge potential exist for local people to benefit from the AFWR project. Due to their lack of business skills and business experience, local entrepreneurs will have to be guided and trained in order to develop these skills.

3.4 OPPORTUNITIES THAT DERIVE FROM THE DEVELOPMENT OF A WILDLIFE AREA

The development of the wilderness area and game blocks (the core wildlife-wilderness zone) forms the basis of all developments on the Coutada: without especially the wilderness area (refer to the zoning map), tourist developments will undoubtedly be very limited. Although the CIO's derived from the core wildlife-wilderness zone as such should not be regarded as less important as those from the lodge, ensuring sustainability and proper maintenance of the natural resource, are of utmost importance - without the wilderness area to act as a major drawcard, there will be no tourists.

The CIO's to be derived from this innovative conservation action can be classified in the following groups: direct employment, indirect employment, associated activities and thirdly the consumptive utilization of game.

J5 Individual conservation incentives and conservation-initiated opportunities

Category	Remarks and/or recommendations	Input required	Expected benefit to community (monthly income)
(1) Obligated compensation for the community	Compensation for the use of the land and the sacrifices made by the local community in order to accommodate the development of the Coutada, tourism facilities and investor game blocks in a mutually satisfactory manner. (Community Trust Fund)	Logistical support	10 beds @ 40% Occupancy ± $12 500 pa
(2) Lifestyle opportunities	Developments on the Coutada have created an awareness of the area and the economic spin-off activities resulted in improved standards of living.	Guidance	Indirect benefit to community
(3) Opportunities originating from tourism activities:	Tourism is generally regarded as the fastest growing industry in the world and Mozambique, with its scenic beauty and diversity of unspoilt habitats, is ideally positioned to gain an advantage from it.	Training and guidance	Direct and indirect benefit; not calculable
(4) Opportunities derived from the wilderness area/ game blocks	Proper management and maintenance of fences, roads, water reticulation network, etc is necessary.	Training & supervision	Direct (salaries and wages) and indirect benefits; not calculable yet
OPPORTUNITIES ORIGINATING FROM TOURISM ACTIVITIES:			

(1) Construction phase	Construction of tourism facilities and privately owned game blocks have already created, and will create in future on a bigger scale, many direct employment opportunities as well as indirect benefits to local people. Maximizing the use of local material and labor resulted in increased spending in Mozambique	Supervision & training	Salaries & wages; piece jobs; not calculable yet
(2) Operational phase	It is estimated that approximately 250 permanent employment opportunities will be created by the lodge, wilderness area and game blocks. Many indirect opportunities exist for members of the local community as well.	Training	Employment; not calculable yet
(3) Indirect opportunities	The lodge and tourist facilities will require certain services from the community, as well as products that can be supplied/produced by the local community.	Training & guidance	Direct benefit/income to participants; not calculable
(4) Maintenance of facilities	Facilities such as the current lodge and future facilities will require continuous maintenance (painting, re-thatching, new jeka, etc). Labor can be supplied by the local community.	Training and supervision	Direct income; not calculable
(5) Vegetable produce	Fresh produce will be difficult to obtain. Members of the local community can sell surplus products to the lodge and private houses	Training & guidance	Direct income; not calculable
(6) Manufacture of curios	Local curios are in short supply, but should be in great demand by visiting tourists	Training Capital for tools and equipment	Direct income; not calculable

(7) Security services	Employment opportunities, either on a permanent basis or as indirect employment, should exist.	Training	Direct income; not calculable
(8) Guiding services	The vastness of the area should ensure that visiting tourists/game block guests will require guiding services to optimize their Africa experience.	Supervision Training Reservation assistance	Direct income; not calculable
(9) Entrepreneurial opportunities	Although hampered by a lack of capital funding, numerous opportunities exist for local people to become entrepreneurs and reach a decent standard of living.	Capital requirements for tools and equipment Training & supervision Marketing assistance	Direct income; not calculable
(10) Dhow transport	Dhow transport of visitors on wilderness trails offers an entrepreneurial opportunity for local dhow owners.	Limited supervision Reservation assistance	Direct income; not calculable
(11) Wilderness trail operators	A wilderness trail, managed by a knowledgeable local operator for his own account, can enhance the Africa experience of tourists.	Limited supervision Training Reservation assistance	Direct income: 30 pax x $5 = $150
(12) Makoro-type trips on Rio Save/ in lake area	Botswana-style makoro trips on channels and between lakes offer an adventurous experience for tourists and can easily be run by local people.	Limited supervision Training Reservation assistance	Direct income 20 pax x $5 = $100
OPPORTUNITIES CREATED BY WILDERNESS AREA AND GAME BLOCKS			

(1) Direct employment opportunities	Effective management and the continuous monitoring and efficient maintenance of this primary resource necessitate the appointment of a number of permanent people. Training for personnel must be provided. The suggested staff structure, as indicated in this BBP, necessitates the appointment of more than 100 people in management positions and in operational and support positions. Although salaries and wages are normally not regarded as 'conservation incentives', it should be seen as a benefit to the community.	Supervision Training Monthly wages	Direct income Approx $27 000
(2) Indirect employment opportunities	Many services to the Coutada itself, or tourists visiting the Coutada, can be provided by temporary employment or freelance operators. Limited training will be required and knowledge and experience of local people can be utilized in this regard, offering them the opportunity to improve their lifestyle.	Supervision Training	Direct income; not calculable
(3) Guiding (Hiking trips, game viewing and bird watching)	The knowledge of local people can be explored in guiding tourists around the Coutada. At the same time it will prevent tourists getting lost and ensure an income to local people on part-time employment.	Supervision Training Reservation assistance	Direct income; nor calculable

(4) Collection of medicinal plants	The collection, selling and possible processing of medicinal plants can offer income-generating opportunities to local people if it can be done on a sustainable basis. Research will be required to establish the medical characteristics of plants. Control and supervision will be necessary.	Research Supervision Training Monitoring	Direct income Approx $200
(5) Collection of firewood	Firewood will be in great demand by the lodges and private houses. Although a task that can be easily performed, collateral damage to the environment can be done. Therefore proper control will have to be exercised. Scientific inputs will be required to determine the sustainability of this incentive.	Supervision Monitoring	Direct income Approx 200 x $1/bundle = $200
ASSOCIATED OPPORTUNITIES The Afro-environment, with its unique customs, traditions, habits and history should be utilized and preserved.			
(1) Cultural centre	Although a cultural centre can be explored by tourists, the value of such a centre will mostly be to the advantage of the community itself. Traditional musical instruments and dances, customs and their unique everyday practical activities should not be lost to future generations.	Planning Construction Supervision	Income and benefits for community 100 tourists x $2 = $200
(2) Training and education centre	Conservation and sustainability can only be enhanced by training and education, especially for future generations and for adults who never had the opportunity in the past.	Planning Construction Operation	Income and benefits for community

(3) Research station	The Coutada comprises of such unique, complex and diverse characteristics, of which little is known, that the establishment of sponsored basic research facilities are essential. Local people can assist scientists with research projects, for which they can be remunerated.	Planning Construction Operation	Income and benefits for community
(4) Organic agriculture	Having been agriculturists all their lives, and with current limitations on historical agricultural practices, it seems only logical that organic agricultural methods should be promoted amongst the members of the community (Refer to the agricultural discussions above)	Supervision Training Capital	Income and benefits for participants
Consumptive utilization of game	Introduction of game. (The cost of introducing game, and the income derived from that game, should not be regarded as a direct incentive to the community.)		
(1) Trophy hunting	Trophy hunting will be the most profitable utilization option and maximum number of surplus game should be utilized using this option. Trophy hunting should/could be outsourced.	Supervision Training	Future income Hunting levy to be paid to Community Trust Approx $78 000
(2) Game meat supplies	Surplus, non-trophy animals should be hunted and the meat utilized	Supervision Training	Future income
(3) Selling of live game	Future activity		

			Estimated potential gross income: Incentives $27 647 pm $331 764 pa Salaries & wages $27 000 pm $325 000 pa Game utilization $78 000 pa

J6 SUMMARY

The development of the Coutada and associated tourist, wilderness and agricultural facilities will have a huge impact on the lives, livelihoods and lifestyles of the local people residing in the area. The developments at the lodge and surrounding area have already led to increased wealth and prosperity. It is envisaged that a furniture factory, a honey refinery and game scouting activities will further enhance the opportunities of the local people.

A direct result of the conservation effort (fencing wildlife areas, restocking of game, continuous management and control of the game, consumptive utilization practices, and others) is increased employment opportunities for the local people. It is estimated that at least 100 local people will be employed during the construction phases, and another 88-plus in the wilderness area alone during the operational phases. Adding the employees of the envisaged 20 cattle ranch operations, may bring the total number of full-time employees to more than 400 at full development.

The conservation-initiated opportunities (CIO's) cannot easily be quantified. They emanate from an ongoing process and care should be taken that it does not stagnate and become of little value to the community. However, these conservation benefits can lead to a huge advantage to the community if efficiently managed. New CIO's should constantly be developed and implemented.

It should be accepted that the community will need assistance to optimize the benefits from the CIO's. One form of assistance will be to provide training to community members in order to develop specific skills that are in demand (guiding, hunting skills, skinning and caping, tanning of game skins, etc). Secondly, the provision of capital to initiate projects will have to be considered. The capital required for implementing CIO schemes will depend on the amount available and on the scale on which the incentives/opportunities will be implemented. Needless to say, the bigger the advantage to the community, the better they will cooperate with, and support the conservation initiative. The scope of these projects must still be determined.

It is accepted that the income generated from the consumptive utilization of game will be applied to cover the running and management costs of the Coutada and will not be regarded as a direct benefit to the community.

Managing the CIO scheme will be an ongoing process, and provision should be made to establish such a capacity.

Continued monitoring will be essential to ensure that the natural resources are not depleted over time. The advantage of the CIO's to the community, will correlate with the amount which will have to be spent to ensure enforcement of sustainable utilization measures.

PART K: ECONOMIC ISSUES AND ANALYSIS

CHAPTER K1 ECONOMIC ISSUES AND ANALYSIS

1.1 INTRODUCTION

The protracted civil war of the 1980's and early 1990's, has changed Mozambique into one of the poorest countries in the world. Very little economic activities took place during that period, especially in the rural areas, and the average Mozambican struggled to survive.

Even the smallest developments after the war caused ripple effects. The economy was at such a low level that any development or growth had a huge impact on the nation as a whole. However, growth based on such low levels indicated a positive trend that was not really reflected by the actual extent of that growth.

The almost non-existence of economic activities changed after the war and today, only twenty years later, some degree of prosperity can already be seen.

The inhabitants of the Coutada, however, are still living in a state of poverty. They are a community that struggles to survive, with basically only the natural resources of the area available to them to earn a living. Although a change has taken place and the economy is slowly recovering, it should be accepted that there will still be some uncertainty and that, for the near future, huge pressure on the natural resources will continue to exist. It is an unfortunate fact that the unsustainable practices of the past are continuing unabated to this day. AFWR recognizes this fact, and has structured the rehabilitation of the Coutada in such a way that it will greatly contribute to the upliftment of the poor community. At the same time the extreme pressures on the environment will decrease substantially, and will hopefully stabilize at acceptable levels.

The incentives initiated by the proposed conservation action on the Coutada, is discussed in Part J of the BBP. The impact of these incentives was provisionally estimated and is summarised below.

For the purposes of this study, a distinction was drawn between the incentives originating from the proposed conservation action for the community, and the economic results from operating the Coutada as such. However, it must be assumed that the community as such will benefit to a much larger extent from direct and indirect employment opportunities, than from economic results from operating the Coutada.

The aim of this analysis is partly to ensure that the activities within the Coutada *are managed in a sustainable manner. In order to conserve and sustainably* use the biodiversity assets of the Coutada, mechanisms to ensure effective management will be established. Protected areas cannot exist in isolation. Economic realities such as growth in neighbouring countries, international tourism trends, security-related issues, development of infrastructure and others will have a huge impact on the economic assessment of the Coutada.

The scope of this provisional economic analysis includes (i) an estimation of the economic value of the project, (ii) a design for appropriate economic mechanisms to maximize the biodiversity benefits of project activities, and (iii) to determine a cost-benefit analysis of the project. Economic incentives are discussed above.

Data was gathered during a field trip to the Coutada. Discussions were held with Coutada management, the lodge operator and other stakeholders.

1.2 ECONOMIC BACKGROUND

Mozambique, a country of approximately 802 000 sq km and a population of almost 23 million, with an annual population growth of 1,47%, is located in Southern Africa. The long civil war and recurrent droughts have resulted in increased migration to urban and coastal areas with adverse environmental consequences. (www.germanchamber.co.za).

Mozambique gained independence on June 25, 1975. Before the peace accord of October 1992, Mozambique's economy was devastated by a protracted civil war and socialist mismanagement (www.germanchamber.co.za). It is believed that in 1994, Mozambique was one of the poorest countries in the world.

Since 1996, inflation has been low and foreign exchange rates stable. Albeit from a small base, the country achieved one of the highest growth rates in the world in 1977-99 (www.germanchamber.co.za). In spite of these positive aspects, Mozambique still depends to a large extent on foreign assistance to initiate further growth and to pay for the trade imbalance, with imports exceeding exports.

Reliable statistical information is very difficult to obtain. Even those given by reputable institutions, such as the Mozambican Government's National Statistics Institute, World Bank and USAID, differ drastically in value. This is primarily due to different weights placed on the data by the various institutions. The following figures nevertheless give an indication of the current situation.

	1996	**1997**	**1998**	**1999**	**2000**	**Source**
National Growth Rate (Note 1)	6,4	6,3	10,0	10,0	5,7	
Inflation	17	5	-1,3	4,5	11,4	
GDP (US$ bn)	1,66	1,76	3,9	4,3	3,8	
GDP per head (US$)	106	109	236	256	219	
Prime interest rate	Not available					
Exchange rate (US$)	11,295	11,430	11,853	12,446	15,164	
Unemployment		21%				

Earnings per capita	Figures are not available It is estimated that more than half of the population lives beneath the poverty line					
Population (Note 2)	16,18 m	16,54 m		19,29		
Foreign Reserves (Excl gold)	344,1	517,4	608,5	651,6	725,1	
GDP per sector (MT bn): Agriculture Fishing Construction Transport / Communication Business Restaurants/hotels Education & Health Other services	 9969 1311 2060 2826 7915 278 592 3929 32719	 12011 1549 2597 4381 9253 491 787 4460 40554	 12670 1595 4118 4552 9738 563 1098 4957 46427	 13779 1557 4360 4816 9903 605 1384 5676 50827		
Agriculture Industry Services		34% 18% 48%				
Minimum wages (MT)		301,6				www.agoa.mu

Source: Dept of Foreign Affairs, RSA (Unless otherwise stated)

Note 1: Averaged 6,7% between 1993 to 1999
Floods of 2000 caused a major slump in growth

Note 2: Urban population: 36,5% (Growth 1997: 8,5%)
Children per women: 6,2 (1998)

It should be noted that although 45% of the total land area is suitable for agriculture, only about 6% is actually cultivated (www.places.co.za). 80% of the labor force is involved in agriculture, and only about 9,5% in industry.

The unemployment rate is extremely high (21%, 1997 est), with 70% of the population living below the poverty line (www.agoa.mu).

Mozambique, with a unique historical and cultural heritage, low human population densities, tropical beaches, coral reefs, spectacular landscapes, rich architecture and small desolated islands close to the coast, has a huge tourism potential which is only now starting to bloom. As recently as only five years ago, this would have seemed an improbable tourist destination for all but the most adventurous of travelers.

The Coutada 5-project must be assessed against this background.

1.3 CONSERVATION INCENTIVES

The conservation incentives identified in Part J, can be listed as follows:

- Conservation-initiated opportunities
- Opportunities that originate from the development of tourism facilities
- Lifestyle opportunities
- Tourism activities
- Opportunities that derive from the development of the Coutada
- Direct employment opportunities
- Indirect employment opportunities
- Associated activities

It was estimated that an amount of approximately US$ 500 000 would be required as capital expenditure to ensure the implementation of the suggested incentives, with a resulting ± US$27 000 monthly benefit to the local community. However, it must be emphasized that these amounts should only serve as guidelines for budgetary purposes and not as the alpha and omega of the actual situation. A proportional equation between development capital and conservation benefit exists and the benefit to the local community can be increased by a higher capital investment. Unfortunately the opposite is also applicable.

The financial success of the incentives will depend on the following:

- Logistical support to the entrepreneurs
- Management assistance and involvement in incentive schemes
- The number of tourists that will eventually visit the Coutada, e.g. economics of scale
- The approach of the local people as far as their involvement, commitment and attitude are concerned.
- Training and guidance to local entrepreneurs

The benefits that derive from conservation incentives, tourism activities and Coutada management are inter-linked and a clear distinction between them cannot be drawn. The creation of an employment opportunity can be regarded as income to the community and an incentive to conserve, but at the same time as expenditure to the Coutada operation. A holistic approach is required to estimate the total impact of the project on the lifestyle and lives of the local community and, at the same time, to measure the economic impact of the project in monetary value.

1.4 THE ECONOMIC VIABILITY OF THE PROJECT

Note: The following discussion should be regarded as only an indication of what can be expected with respect to the economic viability of the project. There are so many assumptions, that quantifiable conclusions can not readily be made. A detailed outline of the calculations made to arrive at the conclusion (see below), is thus not provided.

The economic viability of the project should be judged against the economic background of the country: the country is in a sensitive stage of economic recovery and the community still struggles from poverty, but growth potential does exist and the inhabitants of the country treasure the idea of improvement. It is therefore essential that this project not be judged in isolation of the economic realities in the country.

The unique nature of the project, with the continuous involvement of private investors guaranteed, can be regarded as a benchmark for future developments. However, private sector involvement to this extent necessitates sound conservation management, a well-planned tourism development strategy and a monitoring and evaluation system to access the impact of the development on the environment on a continuous basis.

Conservation initiatives and development initiatives cannot be separated. The development of basic infrastructure will be a direct benefit to the community; it will facilitate the development of the Coutada but will also serve the needs of private investors and tourists.

It is argued that without tourism developments there would be no conservation initiative, and *vice versa*. As a matter of fact, management draws no distinction between tourism development costs and the costs to conserve the environment. They regard it to be integrated to such an extent that it should be treated as total project costs without any attempt to allocate parts to either tourism development or environmental development.

However, it would be difficult to motivate the construction of a landing strip or that of the gas pipeline purely from an environmental perspective - it can be accepted that the private investors and visiting tourists will benefit to a much larger extend from these constructions. At the same time it can be argued that no tourism development would be possible without a landing strip or the gas pipeline and that these development costs should be seen as an opportunity cost that ultimately benefits the environment.

There is no doubt that the development of the Coutada will positively contribute to the economic growth of the country in general, and the region in particular.

The total development budget amounts to a conservatively-estimated total of approximately $32,6-million, of which a major portion will be spent in Mozambique with limited dollar drainage to neighboring countries. The major portion of this sum goes to the conservation and environmental components of the project.

Annual operating costs are estimated to be in the region of $450 000, which would comprise by far the largest single economic activity in the whole region.

Although the accuracy of annual expenditure estimates can be questioned, or the efficiency of the amounts to be spent, the bottom line dictates that the more money is spent, the bigger the advantage to the community, the area and the country.

What should be questioned is the long-term economic sustainability of the development. Annual operating costs is estimated to be approximately $450 000, with expected annual incomes almost impossible to calculate at this stage, due to the large number of imponderables that will have to be considered. It can safely be assumed, though, that the project will operate at an annual loss for at least the first six years. This annual loss has provisionally been estimated at $140 000.

The short- and medium term expectations should not deviate from the above estimation. There is little reason to believe that any adjustments to those figures will occur in the first six years of the project's life. Only after 6 years can any real change or improvement be expected, due to the fact that game will only then be consumptively utilized. However, effective management should still be required to ensure break even after the sixth year.

Management should ensure at this early stage that the annual shortfall of about $140 000 for the first sixth years of the project's life should be provided, which amounts to a total requirement of approximately $840 000.

An analysis of the expected annual income does not prove to be of any convenience to management either. The bulk of the expected income (±67%) will be generated from tourism levies (including consumptive tourism) and there is little hope that this source can be increased without penalizing the burdened contributors to an unrealistic level. Other income sources are already tapped to their fullest extent and no significant increase can be expected. As is indicated in numerous section of this BBP, AFWR will strive to raise financial donor assistance for some of the developments; should such assistance be forthcoming, the extremely bleak picture with regards to economic viability may, depending on the extent of the assistance, dramaticsally improve.

Private investors, tourists and other visitors to the Coutada would be willing to contribute to the running costs of the Coutada, as long as they are convinced that the money contributed will be used for that purpose. Maintaining Coutada integrity and creating tourism and investor infrastructure should be worthwhile causes for contributions, but even with low elasticity, upper limits for levy levels do exist.

An analysis of annual operating costs is alarming - except for human resources (57% of total expenditure), no clear-cut savings can be suggested.

The medium term sustainability of the project is thus in question. The critical period is the first 6 years of the project's life, after which period it should break even because of additional income that can be generated through the consumptive utilization of surplus game.

However, and very important, it should be noted that benefits to the community through conservation incentives have not been taken into consideration in the above calculations, as is the case with the conservation benefits. The macro impact to the community may well justify the financial shortfall - not to mention the conservation benefit that will be derived from the establishment of a working Coutada. However, the bottom line is that someone has to pay the shortfall of $140 000 per year during the first six years of the project's existence - be it the developers, the private investors or (hopefully) some or other international donor agency

PART L: ADMINISTRATION

CHAPTER L1: MANAGEMENT PROGRAM AND STRUCTURES

1.1 MANAGEMENT APPROACH AND STRUCTURES

1.1.1 Company management approach, policy and structures

(1) Approach and policy

Should a well-trained and experienced personnel corps have been available, which is unfortunately not the case, the management approach to be followed at Coutada 5 would have favored the bottom-up or consultative approach, with the staff consulted or involved in an active manner, rather than the more prescriptive and less inclusive top-down approach that is driven by senior management.

Neither of the two approaches is individually fully appropriate to the Coutada 5 situation, and will be sensibly combined. The General Manager of Coutada 5 (see the proviso below) will effectively take decisions and will ensure that they are implemented, whilst acknowledging the need for a more consultative approach. Consultation will be integrated into the management system to the maximum extent possible, as is evident from the following system that will be employed.

(2) Management system: internal line and staff structures

The management system that will be applied, is evident from the discussion below. It involves the following structures, entities, procedures and functions:

The AFWR/Coutada 5 Steering Committee

The mission and development functions (which area similar to the project objectives) of the Steering Committee are illustrated in the following box. It should be noted that the Steering Committee would for all the listed groups of functions, be responsible for laying down applicable policies in order for the objectives to be realised, within the parameters as laid down by the BBP, by other development plans and the appropriate EIA's

COUTADA 5 MANAGEMENT STRUCTURES
MISSION (ROLE) To ensure the effective conservation of the terrestrial and freshwater resources by means of low intensity, rigidly controlled and environmentally sensitive commercial development to the benefit of the local communities, investors, and the broader region., and to ensure that the development guidelines of the BBP and its associated subordinate plans, are effectively implemented and all the project objectives are ultimately realized

OBJECTIVES (FUNCTIONS)

Ultimate authority

The Steering Committee is the ultimate authority for Coutada 5**,** but is not involved with the day-to-day management of the affairs of the Coutada. Wherever reference is made in the following discussion to any management actions, it should be viewed in the light of this global allocation of responsibilities, and should not be considered as a hands-on involvement. Rather, such an involvement is the direct responsibility of the Management Committee (see below).

Rehabilitation and biodiversity/natural resources management

- To ensure that the zoning plan for Coutada 5 is implemented
- To establish an effective management system for Coutada 5, and to ensure that it is maintained;
- To understand, and ensure that it is maintained, established ecological processes through dedicated planning and management orientated research, and to disseminate information and experience for the benefit of conservation in general;
- To secure, rehabilitate and maintain, if and where necessary, physiographic areas, biotic communities, genetic resources and species, thereby to contribute to ecological stability, diversity and sustainable use in Coutada 5 and the broader region;
- To implement practices for sustainable use of natural resources in Coutada 5, and the broader region;
- To eliminate and thereafter prevent exploitation or occupation inimical to the purposes of designation.

Agricultural- and other development activities

- To establish and maintain an effective agricultural system for the agricultural zones of Coutada 5, as prescribed in the appropriate plans, and the appropriately zoned areas
- To ensure that the agricultural developments take heed of the general biodiversity conservation requirements, and is executed in accordance with the appropriate plans
- To ensure that all community-based agricultural ventures involve the farmers in a meaningful and constructive manner

Resident community development

- To promote and facilitate resident community participation and co-ownership (where applicable) in the development of Coutada 5
- To empower resident and local communities by supporting and contributing to the maximum extent possible, to lifestyles and economic activities which are sustainable and in harmony with nature;
- To exploit opportunities for community participation in regional economic and social development programs

Economic sustainability

- To ensure that revenue generating development and economic activities are viable, profitable and in harmony with nature;
- To ensure funding of specific socio-economic and conservation initiatives, out of income derived from the abovementioned ventures;
- To encourage and secure donor and institutional support to achieve the socio-economic and conservation objectives of the VCWS.
- To assist private investors in achieving economic viability

Tourism

- To promote and provide for visitor use for inspirational, educational, cultural and recreational purposes;
- To ensure that visitor use and behaviour does not impact negatively on the biodiversity of Coutada 5;
- To facilitate and promote entrepreneurial opportunities for resident community members in the tourism trade

Supervision

- Supervise the activities of the General Manager (GM)

The AFWR/Coutada 5 Management Committee

In order to accommodate the practical development situation on the ground, as dictated by various realities, it has been decided that the initial day-to-day management and rehabilitation of Coutada 5 will be entrusted to a three-man Management Committee. This triumvirate will be responsible for the implementation of all the policies and plans pertaining to Coutada 5. As an interim measure, the committee will also handle the functions of the vacant post of General Manager and Deputy General Manager, as well as some of the functions allocated to the posts of Division Heads, most of who will also be left vacant (see below).

The Coutada 5/AFWR General Manager

The Coutada 5 General Manager (C5-GM) will be the most senior executive (line function) officer on-site. He will execute policies and will be responsible for the global management of the Coutada. The role and functions of the C5-GM are as indicated in the following box:

Note: It has been decided that for the duration of the initial establishment period, the post of GM will be left temporarily vacant (for a period yet to be decided on). The functions of the GM will be shared by a three-man Management Committee, consisting of experienced managers.

GENERAL MANAGER

ROLE
To ensure that all management services (biodiversity, agricultural, community) are provided, executed and improved (where applicable) in accordance with the policy and objectives of the Steering Committee, as contained in this BBP
FUNCTIONS ▪ Assist in the formulation of policies to give effect to the achievement of AFWR objectives; ▪ On instruction, represent the Steering Committee in advisory committees and other forums; ▪ On instruction, liaise with institutions and organizations ▪ On instruction, liaise with Coutada 4 and/or the proposed public-private partnership with Zinave NP ▪ Oversee (manage)* resource (biodiversity) conservation-, agricultural-, community-, tourism- and administrative support services. * Manage: Policy formulation, organization, staffing, financing (budget) and planning as empowered at this level of the hierarchy

Deputy General Manager and Operations/Support Staff

The last tier in the line function hierarchy represents those who are responsible for the day-to-day running and maintenance of Coutada 5, and the services provided. A very brief description of the role and functions of the Deputy General Manager is provided in the following box. To give an indication of the scope of what is to be delivered, a few of the more important activities of the staff/operational divisions are listed under each service.

Note: As an interim measure, the post of Deputy General Manager will purposefully be left vacant. The responsibilities of the vacant post will be handled by the Management Committee.

ROLE, FUNCTIONS AND SERVICES PROVIDED BY THE DEPUTY GENERAL MANAGER AND OPERATIONS DIVISIONS	
ROLE To render effective Resource Conservation-, Agricultural-, Community-, Administrative Support- and Strategic Plan Services **FUNCTIONS** • Assist in the formulation of policy to give effect to the achievement of the Coutada 5 objectives; • On instruction represent the Steering Committee in advisory committees and other forums; • Oversee (manage) Resource Conservation-, Community-, Administrative Support and Strategic Plan Services	
DIVISION 1: RESOURCE MANAGEMENT	**DIVISION 3: COMMUNITY SERVICES**

FUNCTIONS

Field services (aquatic and terrestrial)

Provide and maintain infrastructure as per approved plans

Control alien and invasive species

Undertake rehabilitation projects, such as old and disused slash-and- burn areas

Monitor species and systems as per management plan (eg. checklists) and Operational Plans

Monitor introduced species.

Undertake burning programs and monitor effectiveness

Assist with implementation of relevant OP's

Security Services

Police the consumptive utilization of resources

Enforce legislation and policy measures as per instruction and as outlined in an OP

Monitor introduced species

Man controlled gates

Patrol fences and borders

Guarding of facilities

Visitor and Education Services

Provide and maintain infrastructure

Undertake surveys to establish visitor satisfaction and needs

Provide and maintain educational facilities and material

Scientific Support Services

Assist contracted specialists with surveys and undertake specific monitoring projects

Maintain data bases and infrastructure

DIVISION 2: AGRICULTURAL SERVICES

FUNCTIONS

Provide/arrange agricultural extension service

Establish and monitor agricultural unions: investors and smallholder farmers

Liaise with government agricultural institutions

Monitor implementation of agricultural OP's

Monitor effectiveness of agricultural practices

FUNCTIONS

Community liaison

Establish and attend forums for liaison purposes

Supervise Non-strategic Community projects

Market
Marketing
Transport

Monitor consumptive utilization

Plants
Marine and freshwater species

Provide educational services

Facilities
Programs
Material

DIVISION 4: STRATEGIC PLAN SERVICES

FUNCTIONS

Strategic Terrestrial Wildlife Plan: Implementation (refer to text)
Strategic Agriculture Plan: Implementation (refer to text)
Strategic Community plans: Resettlement and Development: Implementation (refer to text)
Consultation Plan: Implementation (refer to text)
Tourism Plan: Implementation (refer to text)
Operational Plans: Compilation and Implementation

DIVISION 5: ADMINISTRATIVE SUPPORT

FUNCTIONS

Assist with implementation of relevant OP's

Personnel: apply general staff management procedures

Budget and Finance (GAAP)

Stores and equipment

Purchases

Maintenance

Registry

Communications

(3) Staff establishment

The proposed staff establishment is aimed at staffing the Coutada at full development with all the primary functions being executed and all the envisaged operations being implemented. Since such full development may take upwards of 15 years, it is obvious that the exercise is currently purely theoretical. The estimates would furthermore tend to be very conservative. However, AFWR has to envisage, and plan for, the scope and extent of future developments, and must furthermore assume that all the stated objectives for Coutada 5 will in due course be realised. Initially, many of the envisaged posts will be left vacant; posts will only be filled as and when circumstances dictate that the position(s) should not be left vacant any longer. The minimum posts needed during the initial set-up phase (the first five years) are indicated next to the posts. In addition to these permanent posts, at various times during the development (for example when fencing operations are in full swing) the use of temporary posts will be inevitable.

Generally speaking, the number of posts indicated to develop, rehabilitate, manage and utilize Coutada 5 at full development, are probably underestimates. The numbers and structures should thus be viewed as indicative of the complexity of the task at hand, and not as final figures.

The staff establishment and allocation of staff to the operations/support divisions for Coutada 5 at full development, can be summarized as follows (temporary posts are not indicated):

<u>Senior management staff</u>

General Manager **(temporarily left vacant)**
Deputy General Manager **(temporarily left vacant)**
(Note: Whilst these posts are left vacant, the functions pertaining to the posts will be handled by the Management Committee. The post of GM will need to be filled as soon as daily senior management decisions need to be taken)

<u>Division Heads (Middle Management Staff)</u>

Field Services and Security Services (This post will have to be filled as soon as the Division becomes fully operational; it may, as an interim measure, initially be filled by an expatriate on a short-term contract basis)
Community Services (excluding agriculture) (Whilst the post may be **left vacant** as an interim measure, the Management Committee will have to establish and operationalize the Division)
*General Services (including agriculture, tourism, consultation program and interpretation) (*Whilst the post may be **left vacant** as an interim measure, the Management Committee will have to establish and operationalize the Division)
Scientific Support Services (This post will be **left vacant** indefinitely; the functions will be handled by the Management Committee)

*Administrative Support Services (*Whilst the post may be **left vacant** as an interim measure, the Management Committee will still have to set up the Division. The Lodge Supervisor will act as the interim head of the Division)

Operations and support staff

(1) Field Services Division:

Support Staff Unit	*1 x Mechanic* (**initially vacant**) *1 x Handyman* *1 x Storeman* *3 x Driver* **(initially vacant**; to be filled as development progresses)
General Assistants Unit	*1 x Senior Chief* *2 x Section Chief* *18 x General Assistants* *(these posts will be filled as development progresses)*

(2) Security Services Division:

Field Ranger and Fence Patrol Unit:	*1 x Senior Chief/Sergeant* *3 x Chief/ Corporal(initially **one vacant)*** *12 x Field Ranger (initially **six vacant)*** *12 x Fence Patrol (initially **all 12 vacant**; to be filledon a need basis once wildlife has been reintroduced and/or the predator camps become operational)*
Guards unit	*6 x Guards (only filled once guard posts are set up)*

(3) Community Services Division:

Social Plans Facilitator	*1 x Facilitators*
Non-sustainable Plan actions /training	*2 x Assistants*

(4) General Services Division:

(i) Agricultural Services Sub-Division:

Agricultural Extension Officers	*2 x Extensionists (**initially left vacant**; will be filled only when agricultural projects are becoming operational)*

(ii) <u>Consultation (local) and interpretation Sub-Division:</u>

*2 x Interpretative and Consultation Officers (**initially left vacant**)*

(iii) <u>Tourism/hospitality Sub-Division:</u>

Hospitality staff	*3 x Hunting/tourism camp supervisors (**initially vacant**)* *3 x Chefs (2 **initially left vacant**)* *12 x Hospitality staff (**filled as development progresses)*** *3 x Gardeners (**filled as development progresses**)*
Trophy hunting support staff	*9 x Trackers, skinners, hunting guides (**initially left vacant;** a decision as to whether Professional Hunters will be employed or contracted, or whether trophy hunting will be outsourced, will be taken later)*

<u>(5) Administrative Support Services Division</u>

Administrative support	*1 x Bookkeeper (initially left vacant)* *3 x Clerk (initially **2 to be left vacant**)*

The total posts mentioned above number a very conservatively estimated 102. To this should be added all the posts that would be created once the private investor ventures (cattle ranching and game ranching) are operational. If for example a total of 42 private investors – 20 cattle ranches and 22 wildlife-based ranchers – would become involved, it can be postulated that each wildlife ranch will employ two full time workers, whilst the cattle ranches will employ upwards of four fulltime workers. This will push the estimated total up from 102 to at least 224. The final total number of direct project-related posts may be 400 or even more.

(4) Staff and liaison structures

(i) <u>Coutada 5 Steering Committee</u>

The Coutada Steering Committee for Coutada 5 will be the ultimate authority, and may be regarded as synonymous with a board of Directors of AFWR. In summary, the CSC will:

- Determine its membership
- Establish implementation schedules
- Define general operational policies
- Provide guidance to the Coutada Management Committee (CMC)
- Have the right to veto any decisions taken by the CMC, at their discretion
- Ensure that the CMC operates in accordance with policies and plans
- Ensure that budgetary control is effective
- Need to approve all major expenditures
- Act as liaison with political entities and senior government officials
- Endeavour to generate donor funds

(ii) Coutada 5 Management Committee

The Coutada Management Committee (CMC) will:

- Report to the CSC in a prescribed manner
- Be responsible for the day-to-day management of Coutada 5, through the GM
- Ensure that all policies and plans are adhered to and are properly executed
- Prepare all documents that the CSC may need in order to execute its functions
- Assist the CSC to solicit donor funds
- Liaise with local (and regional and national as needed) political and governmental structures, including the community structures
- Liaise with NGO's and donors, as and when necessary

(iii) Staff Forum

A staff forum will be established, to operate as follows:

- All the members of staff will serve on the forum
- The forum will meet at least bi-weekly
- The forum will initially be chaired by a member of the CMC, but normally by the GM
- Members of the CSC may attend the meetings at their discretion
- Members of the forum will be encouraged to take part in the discussions
- The forum will facilitate interchanges of ideas and information of relevance to the management of Coutada 5, staff welfare and other pertinent issues.

- The proceedings of the forum will not be minuted, but an action list of decisions taken and recommendations made at each meeting will be recorded, for report-backs at the next meeting.

(iv) Government Liaison Committee

It is proposed that a Government Liaison Committee (GLC) be established, to operate as follows:

- The GLC will comprise of (a) a Portuguese speaking member of the CMC to act as chairman, (b) other members of the CMC who can attend, (c) the District Administrator of Machanga or his representative, (d) other district government employees as nominated by the District Administrator, (e) one or more local community chiefs (as arranged with the District Administrator) and (f) the most senior Mozambican citizen serving on the staff of Coutada 5 at the time
- The GLC will provide a forum for a bilateral exchange of ideas, progress with the development of the project and the discussion of any problem areas
- The GLC will ensure that the government officials and other members are kept abreast of progress with the development and rehabilitation of Coutada 5
- The GLC will initially meet quarterly, at a venue to be decided on

(v) Community structures

The policy of co-management will be implemented throughout, whilst realizing that it would be difficult, or mostly impossible due to practical realities, for the AFWR structures to actively involve the communities in all decisions and management actions. This problem will to some extent be alleviated by establishing and using a variety of to-be-established community structures. These structures will be developed and operated as follows, according to an appropriate Operational Plan (yet to be compiled):

- A Coutada Community Agricultural Committee (CCAC) will be established, in conjunction with the District Administrator and the local chiefs
- A Coutada Community Conservation Committee (CCCC) will be established, in conjunction with the District Administrator and the local chiefs
- A Coutada Community Trust (CCT) will be established, to act as the overarching and senior community structure; the CCCC and CCAC will be subordinate to the CCT
- The CCCC and CCAC structures may, depending on practical considerations, be subdivided on a geographical basis, with the subcommittees having the same functions as the main body
- The CCAC and CCCC will act as impartial bodies on behalf of the local communities, with respect to their respective functions

- The CCT and the subordinate CCAC and CCCC will be composed of influential individuals, chosen by the respective communities, in consultation with the district Administrator.
- At least one member of the CMC will attend the meetings of the mentioned structures , and will provide feedback as and when necessary
- Additional appointed members of staff of AFWR will attend the meetings
- The District Administrator and/or representatives of local government will be motivated to attend the meetings of at least the CCT, and to partake in discussions
- The CCT, CCAC and CCCC will be encouraged to draw up their own constitutions, assisted by AFWR and in consultation with the District Administrator
- The CCT, CCAC and CCCC will act as objective bodies to channel any benefits (physical, money or otherwise) generated by Coutada 5 in an impartial manner to the local people
- Any AFWR plans, activities and actions that may have an influence on the local communities, will be discussed with the community structures
- The CCT, CCAC and CCCC will be empowered to address any problem areas that are perceived, and to submit proposals for consideration
- The CCT, CCAC and CCCC will be encouraged to minute the proceedings of the meetings

Planning action: Prepare an OP dealing with the establishment and operations of formal community structures

(v) Investor's Association

As soon as private investors, in whatever field, become involved in the development of Coutada 5, they will be stimulated to establish an Investor's Association, to represent the interests of such investors in the development and rehabilitation of Coutada 5. They may, at their discretion, operate according to their own constitution, as long as it does not come into conflict with the policies and plans of Coutada 5.

(5) Capacity building and training

A combination of historical factors, as outlined elsewhere in the BBP, caused the majority of the potential local workforce to be singularly ill equipped to be gainfully employed from the onset. The Coutada 5 project will have a huge impact on the socio-economic realities of the whole district of Machanga, but even more so at the outlying areas where any full-time employment opportunities are currently almost non-existent. The outlying communities will be cast from a poor subsistence economy with no formal employment opportunities, to an all-encompassing development that would probably forever alter the shape of what used to be.

Furthermore, as was pointed out above, there is a need to subtly change the historical role of women from silent partners to active participants with regards to the composition of project related community committees and structures. This will have to be done in such a manner that local traditions and cultural heritage are respected.

These impacts will, in turn, impact on the management of Coutada 5, and will need to be addressed:

(i) AFWR can for practical reasons not deal directly with the involved people on an individual basis; representative community committees will thus be imperative

(ii) The local people are not accustomed to operate in committee structures, and will have to be subtly guided in order for the various community committees to operate smoothly and effectively.

(iii) All of the community committees will be faced with the challenge of ensuring fair and equitable distribution of economic and resource incentives. They will have to be guided on how to deal with such a situation.

(iv) Judging from the extremely depauperate wildlife populations of Coutada 5, it is evident that unsustainable consumption practices were the order of the day. The concept of sustainability, irrespective of which resources are utilized, will have to be put across.

(v) Some of the community members will be elected to positions on the committees, or appointed to fulfill management tasks on behalf of the communities, where administrative skills and a certain level of literacy would be advantageous or even essential. To prevent outsiders from having to be co-opted to positions of authority on the committees, those incumbents or members-elect who are lacking in the necessary skills, will have to be assisted to overcome their shortcomings. Skills training would be an imperative, even though it will be a long-term project. The AFWR structures may have to appoint suitable members of company staff to act as unofficial secretaries, in order to take minutes of meetings.

(vi) Women will probably have to become more involved in community structures and committees. AFWR will need to play a subtle role in this regard, and will have to operate through the various community committees.

1.2 PERSONNEL MANAGEMENT

1.2.1 Principles and policies

Personnel management at Coutada 5 will be in line with modern principles and policies applying to protected areas, and will be based on a comprehensive General Staff Code (GSC) that will de drawn up specifically to suit the local situation.

The personnel management procedures that will be applied, will take cognizance of relevant Mozambican labor legislation and related laws and policies.

The authority to implement sound personnel management principles and policies rests with the GM (currently the Management Committee, due to the post being vacant), but accountability for such actions remains vested in the Steering Committee.

1.2.2 Overall personnel management objectives

To develop a sound, effective and acceptable personnel management system for Coutada 5, the following objectives have been accepted:

- To establish and maintain a transparent and equitable personnel management system;
- To ensure the promotion of optimal personal growth for each staff member;
- To foster a sense of belonging and to promote *esprit de corps;*
- To provide appropriate and adequate training opportunities;
- To ensure that personnel performance is focused towards achievement of the objectives for the Coutada

1.2.3 General Staff Code

The GM (currently the Management Committee, due to the post being vacant) will be responsible for drawing up a comprehensive General Staff Code (GSC). The GSC will deal with all aspects relating to personnel management, including but not limited to employment contracts, salaries, promotions, duty sheets, annual leave, sick and compassionate leave, bonuses, personnel administration, training, discipline and termination of service, as well as a code of conduct.

The Coutada GM (or Management Committee) may, at his discretion, base the GSC on existing and effective examples from other conservation agencies. It will contain no requirements or rules that may be in conflict with any Mozambican legislation or labor policies.

The GSC will be updated as and when necessary and will also be available in Portuguese.

Planning action: To prepare a General Staff Code in the format of an OP

1.2.4 Coutada Standing Orders

The GM (Management Committee whilst the post is vacant) may opt to include the Coutada Standing Orders (CSO) in the GSC, but will refrain from doing so if the GSC becomes a cumbersome document (which is quite likely).

The CSO will cover aspects not dealt with in the GSC, such as the following:

- Keeping of livestock, poultry and domestic animals in the Coutada (outside of the core wildlife area)
- Visitors to staff living in staff quarters
- Access to the Coutada, especially the core wildlife area, tourist facilities and estate homes, by staff, their families and guests, and vehicles
- Utilization of biodiversity resources, including fishing and collecting of firewood
- Staff flower, vegetable and fruit gardens
- Maintenance, storing, garaging and cleaning of official equipment
- Using official equipment for private purposes
- Official structures (including staff homes), facilities and gardens
- Off-road vehicular access

1.2.5 Preferential employment

A preferential employment policy has been accepted for Coutada 5, and can be summarized as follows:

- Preference will be given to local inhabitants of the outlying regions of the district, and specifically to individuals living within those regions
- Mozambicans from further afield will only be considered for appointment, in those instances where the required expertise or experience for a specific post is unavailable or lacking amongst the local inhabitants, or if suitable candidates cannot be recruited locally.
- Expatriates will only be appointed to posts if suitable Mozambicans are not available.
- The preferential employment policy will also apply to commercial operations such as the tourist lodges, as well as to the staff to be employed by the members of the Investor's Association.
- In those instances where candidates from further afield, and especially expatriates, must of necessity be appointed, local understudies will be identified, and trained to eventually take over after the expiry of the incumbent's contract.

The preferential employment policy will be included in the GSC discussed above.

1.2.6 Staff training, capacity building requirements and training program

The following general principles will apply to staff training requirements and the training program:

- An OP dealing with training will be compiled.
- Each member of staff will receive the necessary in-service or specialized external training to equip him/her to cope with the task at hand. Such

training will be undertaken according to the training schedule included in the OP.
- In-service training will apply to all members of staff.
- In-service training by external specialists/institutions will be undertaken *in situ* or e*x situ,* depending on the specific requirements, at the discretion of the Management Committee.
- More than one competent agency/institution/specialist may be contracted to handle specific training aspects or courses.
- The GM, or his Deputy if he so wishes, will monitor and formally evaluate the training program on a biannual basis.
- The GM will in due course appoint a training officer to co-ordinate training. (The training officer will also have other duties)

1.3 INFRASTRUCTURE MANAGEMENT

1.3.1 Principles and policies

Infrastructure management includes the planning, construction, maintenance, replacement, control (including stock control) and monitoring (including inspections) of all fixed non-commercial structures, equipment and other movable assets. It will be done in accordance with generally accepted norms, standards and practices, as prescribed in the OP, and according to any EIA's dealing with the topic.

1.3.2 Overall objectives

The overall objectives of the infrastructure and equipment management system for Coutada 5 will be as follows:

- To ensure that all infrastructure is used and/or stored and/or maintained in a responsible manner and according to manufacturing prescriptions (if applicable).
- To delegate responsibility for specific infrastructure/equipment to individual members of staff
- To prevent mistreatment of infrastructure/equipment
- To indicate the need for maintenance and/or replacement of specific infrastructure/equipment
- To ensure that the maximum service life of the infrastructure/equipment is realized
- To assist with the compilation of infrastructure/equipment budgets

1.3.3 Fixed structures, equipment and movable assets

Fixed structures (roads, fencing and buildings), equipment and movable assets (including communication systems, power supply and water supply plant, motorized transport, etc will be inspected (and maintained) on a regular basis by staff members appointed by the GM, according to specific OP's.

1.3.4 Operational Plans

Planning action: Prepare OP's for the facets discussed above

1.4 WASTE MANAGEMENT

1.4.1 Rationale

Improper or ineffective waste control may impact on the environment. The waste management system described for two protected areas in the Kingdom of Lesotho was adapted for the following discussion, and for implementation at Coutada 5.

1.4.2 Principles and policies

The basic principle for waste management is the effective collection, treatment and environmentally friendly disposal thereof. In the case of Coutada 5 where no central waste management system will be in place, effective waste management should be a priority.

The following waste management policy will apply:

- Acknowledgement of the fact of waste generation and the need for disposal thereof
- Environmental sensitivity would be built in the planning, design, construction and management of waste disposal facilities
- An effective waste management and monitoring and control system will be drawn up and implemented
- The management system will include waste generated by the tourism industry, the staff facilities and investor camps in the wildlife-wilderness zone

1.4.3 Objectives

The objectives of waste management for Coutada 5 are the following**:**

- To prevent or at least minimise environmental impacts or pollution during waste disposal.
- To provide adequate human capacity for waste management
- To minimise the possibilities of health risks to humans

1.4.4 Threats

The treats to be considered are:

- Smells/odors emanating from decaying organic matter, compounded by the high humidity and temperatures experienced at Coutada 5.

- Fauna attracted by the above (flies, maggots, bacteria)
- Scavenging by people, monkeys, baboons, rodents and birds.
- Visual impact of poorly planned waste disposal sites
- Littering in general, especially non-degradable matter
- Smoke/air pollution originating from cooking fires
- Groundwater contamination through effluent soakaways
- Dust generated by increased vehicular traffic
- Increased noise from vehicles, generators and other equipment
- Vandalism

1.4.5 Management priorities

Priority is to be given to the following waste management aspects:

- Determining the extent of waste generation
- Planning and design of appropriate waste treatment facilities to meet with modern standards
- Construction of effective waste disposal facilities
- Management/operation of such facilities

1.4.6 Management options and actions

The management options are:

- On-site treatment and/or disposal, where all or part of waste treatment/disposal will take place on site
- Off-site treatment and/or disposal, where some aspects of treatment/disposal will take place off-site
- Prevention of pollution, for example oil and petrol pollution from vehicles
- A combination of the above

Management actions include the following:

- Solid waste management will involve the collection, storage, and transport of kitchen refuse, general refuse and packaging material to garbage sites on Coutada 5
- Effluent management typically involves the collection, transport, treatment and disposal of effluent emanating from kitchens, ablution facilities and toilets.

1.4.7 Monitoring of waste management systems and procedures

The most important aspects to be monitored are:

- Groundwater quality, to determine possible pollution by effluent through soakaway pits or other man-made sources

- Quality of water in the fresh water lakes that could possibly be polluted by human actions or activities
- Possible occurrence of sea water pollution in the eastern regions (oil leaks from boats, solid waste etc)
- General pollution emanating from any of the abovementioned sources

1.4.8 Operational Plan

A waste management OP will be prepared.

1.5 SECURITY MANAGEMENT AND LAW ENFORCEMENT

1.5.1 Principles and policies

The management and protection of the biodiversity and other natural resources of Coutada 5, as well as the structures and movable assets entrusted to the Coutada management staff, carry with it a great responsibility and the need to develop and implement an effective security management system. The contract with the GoM is built on the obligations of AFWR to ensure that the land entrusted to its care is managed and taken care of responsibly and sustainably.

1.5.2 Objectives

The objectives for security management are as follows:

- To control the natural resources, biodiversity, infrastructure and movable assets of Coutada 5 in a responsible and effective manner on behalf of all the stakeholders (AFWR, the GoM and the local communities)
- To establish and maintain effective lines of cooperation and communication with the official law enforcement agencies in Machanga
- To investigate the possibilities of selected AFWR security personnel, for example the Field Rangers, being granted powers of arrest and of carrrying firearms
- To clarify the status and authority of AFWR, with regards to the legal status of the company to do law enforcement.

1.5.3 Priorities

The following priorities pertain to security management:

- To draw up and implement security management procedures for the Coutada
- To ensure that the marine and especially the terrestrial biodiversity resources are protected against unauthorized and/or unsustainable use or damage, and are utilized in accordance with the relevant plans, policies, actions and systems as embodied in this BBP and the applicable OP’s, also with reference to the contract with the GoM

- To ensure that security measures including law enforcement are executed in such a manner, that the rightful needs and aspirations of the local communities are protected against excessive security procedures.

1.5.4 Threats

The following threats inherent in the application of security measures will be considered and addressed:

- Law enforcement, although it will always have a positive objective, could easily be perceived and experienced by the local people as a negative action.
- Access control to areas in the wildlife-wilderness zone that could previously be accessed at will by the local communities, but which access will now be prohibited, may create ill feelings
- The Field Ranger unit may not have any meaningful powers of arrest, in which case they would find it very difficult and frustrating to act against transgressors

1.5.5 Management options and actions

The establishment of an effective security system for Coutada 5 would be dependent on implementing the following options and taking the appropriate actions:

- The security system and procedures will be included and motivated in the public consultation and disclosure program (see the PCDP in Part H).
- Access by local inhabitants of the Coutada to specified resources and/or areas in the Coutada in general and the wildlife-wilderness zone in particular, will be strictly controlled in accordance with the principles outlined in various sections in this BBP and in appropriate OP's
- Access to the wildlife-wilderness zone will take cognizance of the presence of potentially dangerous game and will be regulated and managed by AFWR, according to procedures yet to be determined by the Management Committee
- Thje Field Rangers will need to undergo extensive training.
- Field patrols will be undertaken on a continuous basis by the Field Ranger component. Due to the inaccessibility of most of the wildlife-wilderness zone, and indeed most of the Coutada in general, arrangements will be made for setting up a roving patrol system. Temporary ranger outposts will initially be provided, possibly to be replaced by more permanent structures and facilities at a later stage.
- Policing of AFWR staff will be handled by the Field Rangers, in close consultation with the Management Committee
- The Field Rangers will be armed in accordance with Mozambican legislation.
- Effective security measures will be implemented with regards to the handling, transport and banking of money.

1.5.6 Operational Plan

A security management OP guiding the activities of the Field Ranger unit will be prepared; an additional OP dealing with other security facets may be needed

1.6 HEALTH MANAGEMENT

1.6.1 Principles and policies

In a remote and generally inaccessible area such as Coutada 5, with only basic or even only rudimentary medical and health care facilities available in Machanga, the Coutada will need to become involved with primary health care for its workers and their dependents, and should be prepared for medical emergencies that may arise amongst tourists and/or investor- owners and their staff.

1.6.2 Objectives

The objectives of health management would be to ensure that:

- Proper medical care is available, or can be made available, to company staff;
- Emergency medical plans and procedures are available for staff and visitors alike;
- Motivate to the GoM to operate a mobile clinic in the Coutada, especially once new development nodes have been established (for example at the AFWR headquarters facility), and that
- Steps are taken for the control of endemic tropical diseases such as malaria

1.6.3 Priorities, options and actions

The possibility of attracting donor funds to operate a mobile clinic service in the Coutada will be investigated, as well as obviously direct collaboration with, and co-operation from, the local Mozambican health structures.

Coutada 5 will, hopefully through donor funding, have to contribute to the operational costs of the facility, and to provide ways and means of getting the sick and infirm to the health facility in Machanga, and/or to the mobile clinic when needed.

The mobile facility (and probably also the health care facility in Machanga) will have no capacity to deal with real medical emergencies, nor to properly cope with diseases requiring specialised attention. Arrangements will have to be made by AFWR to enlist the services of visiting specialists in a number of disciplines to do locum work in the Coutada.

The prevalence of tropical diseases such as especially malaria gives cause for grave concern, and is possibly the main reason for infant deaths in the Coutada. It is imperative that a proper and effective malaria control program be launched as a matter of urgency. For such a program to be effective, it will have to be tackled on a regional scale with the involvement of the local and regional health authorities. Donor assistance in this regard will hopefully be forthcoming.

The prevalence of malaria specifically could negatively impact on the flow of tourists to the area. This situation will be turned around in the event of a successful local control program, such as the Lebombo Spatial Development Initiative in southern Mozambique and neighbouring areas of South Africa and Swaziland

A few selected members of AFWR staff will have to be trained in first-aid.

1.6.4 Operational plan

Initially the possibility of health co-operation and donor assistance will be investigated, after which an OP will need to be prepared to deal with the above and other aspects relating to health care

CHAPTER L2 FINANCIAL MANAGEMENT AND BUDGET

2.1 GENERAL FINANCIAL MANAGEMENT

2.1.1 Background

In general, sound financial management at Coutada 5 will be aimed at the following:

- The maintenance of accurate records of the financial implications of all the project related activities undertaken in Coutada 5.
- Maximizing benefits from the funds expended in the process of achieving the management objectives of the Coutada as embodied in the BBP.
- Dealing with donor funds according to the prescriptions of the donor agency

In the context of the BBP, financial management is thus to be seen as:

- The accurate recording of the financial implications of past activities;
- Control over the management of funds;
- The implementation of guidelines according to General Accepted Accounting Practices (GAAP) for recording, control and planning;
- Reporting on the financial aspects of project-related operational activities in Coutada 5;
- Separation of expenditure on commercial and non-commercial or project-related activities;
- Reporting on the assets and liabilities of the Coutada;
- Assisting the Community Trust to manage the Community Trust Fund (CTF);
- Managing the capital and operations budgets (not included in this BBP)

2.1.2 Principles and policies

It is accepted that:

- Financial management will be executed according to GAAP as formulated by the accounting profession; and that
- The financial process will be subject to external auditing.

2.1.3 Overall objectives

The overall financial objectives include the following:

- The most effective deployment of the available capital/cash resources;
- Establishing a clear separation between expenditure on commercial and non-commercial (or project-related) items or activities;
- Assisting the Community Trust to administer the Community Trust Fund (CTF) (see below);
- Continuous striving towards attainment of the Coutada objectives;
- Efficient planning of future activities/projects;
- Accurate reporting on all financial matters, including the status of the budget;
- Effective financial control over the financial aspects and assets of Coutada 5; and
- Financial accounting according to GAAP.

2.1.4 Management actions

The following actions will be undertaken:

- **Preparation of an OP** containing guidelines and procedures for the financial management function;
- Ensuring that all involved employees are acquainted with the guidelines and procedures; and
- Ensuring that financial management is executed according to these guidelines and procedures.

2.1.5 Monitoring

The whole process of financial management of Coutada 5 will be monitored by the AFWR Management Committee

2.2 COMMUNITY TRUST FUND (CTF)

The CTF will be established as one of the cornerstones of the principle of benefit sharing. The fund will be controlled and administered by the elected Community Trust Committee according to the abovementioned financial principles and procedures. In this endeavor they will be assisted by AFWR. See also the community development plan (CDP) in Part H for more detail on the trust fund..

PART M: RESEARCH, MONITORING AND EVALUATION

CHAPTER M1: THE RESEARCH, MONITORING AND EVALUATION PROCESS

1.1 DESIGNING AN EFFECTIVE RESEARCH, MONITORING AND EVALUATION PROGRAM

It should at the onset be recognized that the development and rehabilitation of Coutada 5, being a private sector development, would be extremely costly in virtually all respects: financial, time, resources, infrastructure etc. This fact, linked to the very nature of the project, brings an inalienable factor to the fore: the need for the venture to preferably operate at a profit, or at least to brake financially even in global terms. Should the development and management of Coutada 5 have been the responsibility of an official nature conservation agency, an integral part of such a development would have been to undertake the required research in order to better understand the intricacies of the natural and social systems, to which the project would be linked. Such research, as well as the monitoring projects arising from the research results and from the deployment of the project, would then be funded by the taxpayer, or by donor agencies, or by both. Research, monitoring and evaluation (RM & E) is thus universally recognized as an integral part of the development and management, of any area where biodiversity and social resources are involved.

In the case of Coutada 5, the need for applied research and monitoring, encompassing biodiversity as well as social and other factors, is freely acknowledged. However, profitability also has to be acknowledged, as a deciding factor, in determining the allocation of funds and the prioritizing of projects. This prerequisite means that Coutada 5 will have only very limited resources available, if any, to allocate to especially research undertaken by specialists, but to a lesser extent also to monitoring and evaluating all the different facets of the development, especially during the post-development phase.

AFWR will thus adhere to the following principles with regards to RM & E:

a. Applied research is acknowledged as an important part in the process of development and rehabilitation
b. Applied research will only be funded by AFWR if it becomes absolutely necessary, in the absence of donor funding
c. Every effort will be made to enlist donor aid to fund research projects.
d. Every effort will be made to enlist the aid of Universities (local and foreign) to fund and undertake research that will allow AFWR to better understand and manage Coutada 5, inclusive of social aspects
e. The in-house research capacity will be harnessed to the full, should donor aid not be readily available for really urgent research projects

f. The in-house monitoring and evaluating capacity will likewise be harnessed to the full, to determine the success, or otherwise, of development- and management actions
g. All RM & E projects, whether dealt with in-house or entrusted to external sources, will be handled according to approved project plans

AFWR will design and implement a RM & E program to determine the complexity of the current biodiversity resources, to determine the baseline data that exists with regards to these resources and to social impacts, the availability of implementation plans, the availability of in-house expertise, the possibility of assistance from external sources, and finally the level of management interventions that will be needed in order to realize the objectives of Coutada 5.

Planning action: Prepare an Operational Plan

1.2 THE INFLUENCE OF CURRENT BIODIVERSITY-, INSTITUTIONAL-, AGRICULTURAL- AND SOCIAL FACTORS ON THE RM & E PROGRAM

In preparing a RM & E program for Coutada 5, AFWR will take heed of the following aggravating factors, that will, amongst others, necessitate the preparation and implementation of a RM & E strategy:

(1) Climate

It is not fully certain whether a water deficit (when evaporation is more than precipitation) will be experienced, but it seems highly likely that such a deficit may run to 1000 mm or even more. Such a situation will have a meaningful influence on any agricultural activities that may be planned. The prevalence of destructive hurricanes and tropical cyclones will also need to be considered.

(2) Population growth and human pressure

There is clear, though unsubstantiated, evidence of an increase of people living in the ‘natural’ areas of Coutada 5, as will probably also be the case for the town of Machanga. Indeed, the very success of Coutada 5 will in all likelihood entice people to migrate to the district.

(3) Excessive or unsustainable exploitation of natural resources

No reliable data exists, but is strongly suspected that virtually all, if not all, current consumptive uses of natural resources, may be unsustainable. This include marine resources, freshwater resources, harvesting of palm juice for making an alcoholic beverage, and harvesting for woodfuel, bush meat, hardwood and other renewable natural resources. The current extreme paucity of many biodiversity species, attests to unsustainable practices of the past.

(4) Illegal exploitation

It is abundantly clear that illegal harvesting of renewable natural resources are continuing unabatedly, and has been so for some considerable time. Signs of the illegal logging of hardwood are evident, and poachers transporting their illegal harvest have been observed.

(5) Destructive land-use practices

Possibly the most destructive land-use practice of all, namely the age-old but outdated system of slash-and-burn (shifting) crop production, continues at a large scale, especially at 'new' areas such as along the EN1.

(6) Institutional support

Current legislation and environmental regulations in Mozambique are not extensively enforced, and this is aggravated by the fact that for most communities the utilization of natural resources is a matter of survival. Secondly, relevant government agencies seem to have limited capacity to co-ordinate and drive local and regional developments, within the framework of stated national policies.

(7) Social and socio-economic factors

There are a multitude of social and socio-economic factors that will need to be heeded in the preparation and implementation of a RM & E strategy. First and foremost amongst these would probably be the current lack of understanding of all the social factors that will need to be considered. Surveying/researching the wants and needs of the community, will have to be undertaken, followed up by an extensive monitoring program.

(8) Environmental education

Given the previous lack of exposure of the local communities to environmental considerations, whether it is biodiversity-related or of an agricultural nature, an effective environmental education program, undertaken by AFWR, would almost be non-negotiable. Especially possible negative perceptions about the project will have to be identified.

(9) Community structures

As far as could be determined, there are currently no organized or formal community structures that could be used to convey the biodiversity/natural resources/sustainable agricultural message to the local inhabitants of Coutada 5. Such Coutada-oriented structures will have to be put in place.

(10) Biodiversity factors

As is the case with the multitude of social aspects that will have to be researched, there are possibly even more gaps in AFWR's knowledge of the situation with regards to the biodiversity of Coutada 5.

CHAPTER M2: RESEARCH, MONITORING AND EVALUATION OBJECTIVES, SCOPE AND CONSTRAINTS

2.1 OBJECTIVE

The objective of the RM&E strategy is as follows:

To design the mechanisms whereby the project activities can be informed, and their replicability enhanced by the generation of timely and useful results from management orientated research, monitoring and evaluation.

The strategy includes the following elements:

Scoping of a management orientated research program;
development of a monitoring and evaluation strategy; and
preparation of a dissemination plan, in order to inform all involved parties.

The monitoring and evaluation strategy will set out the basic features of the planned monitoring and evaluation work, namely:

(1) Continuous assessment of the state of the Coutada's terrestrial, freshwater and, to a lesser extent, marine resources;

(2) Monitoring of the effectiveness of the management of Coutada 5;

(3) Monitoring the process and impacts of micro-enterprise and community development programs; and

(4) Monitoring the social, economic and environmental impacts of the tourism facilities and activities in Coutada 5.

2.2 CONSTRAINTS

The following were recognised as constraints in the development of the RM&E Strategy (these constraints are common to practically all private sector biodiversity-based developments):

(1) Prior to granting of the concession for Coutada 5 to AFWR, very little published information about the natural resources and resident communities of the Coutada was available. Published data for other areas had to be extrapolated;

(2) A RM&E strategy could not be designed by merely incorporating it in an already existing operational system. In the case of a private sector initiative such as AFWR there are no support systems or government subsidies at hand. This is a concern as the extensive biodiversity management component is entirely dependent on the viability of the revenue-generating facet of the company, and/or the company's ability to generate donor aid.

CHAPTER M3: RESEARCH AND MONITORING

3.1 RESEARCH AND MONITORING STRATEGY

3.1.1 Research and monitoring objectives

Monitoring objective

"To detect and warn of changes which conflict with the objectives of the Coutada, to evaluate the success of management actions, and to generate questions for possible research"

Research objective

"To conduct such research as is necessary for the effective management of the area, and to achieve the objectives of the area"

3.1.2 Research and monitoring proposals

(1) Biodiversity:

Early indications are that the downward spiral of diminishing biodiversity resources, has in most instances already reached a critical, and in terms of the natural ability of nature to rehabilitate itself, an uncontrollable and probably irreversible level. Once a species has disappeared locally, and also do not occur naturally in adjoining areas any more, the only way to rehabilitate the species would be to relocate animals from somewhere else. It is therefore important that biodiversity research and monitoring should focus on management interventions such as controlled and/or prohibited resource utilization, relocation of wildlife and the resettlement of people living in sensitive core wildlife areas. Such an ongoing survey of the terrestrial environment is regarded as essential to determine current and anticipated resource use.

The suitability and availability of species for relocation should be researched fully, probably in consultation with the relevant government institutions. Once animals have been relocated, the success or otherwise of the venture should be monitored on an ongoing basis. Shortcomings could thus be identified, and

remedial steps taken. AFWR would be hard pressed to fund such projects, including the expensive relocation programs, and every effort will have to be made to secure donor aid.

As for the botanical component of Coutada 5, management in the medium term will need to focus mainly on three major areas of concern: the preparation of a management-oriented botanical map, a possible prescribed burning program in especially the core wildlife-wilderness area, and finally monitoring the effect of the wildlife reintroduction program.

Planning action: Prepare an Operational Plan

(2) Social and community aspects:

Since the whole human population of Machanga district, and thus also Coutada 5, will live within the precincts of the Coutada, the interaction between these people and the Coutada will have to be managed and monitored. Should any people have to be relocated to less sensitive areas, such a possibly highly explosive event will have to be carefully executed and subsequently monitored.

Planning action: Prepare an Operational Plan

(3) Tourism:

Adaptive management will have to prevail in the development of eco-tourism facilities within the boundaries of Coutada 5. Such development will have to take place within the requirements laid down by possible EIA studies, and as prescribed by Mozambican policies.

Planning action: Prepare an Operational Plan

(5) Agriculture:

Care will have to be taken to identify and introduce suitable agricultural practises, which will need to be implemented in order to stop some of the highly destructive practises of the past, such as the slash-and-burn cultivation system.

RESEARCH, MONITORING AND EVALUATION SURVEYS THAT SHOULD BE UNDERTAKEN IN COUTADA 5

COMPONENT	ACTION	COMMENTS
Biodiversity		
Birds/Avifauna	1 Observe and record Avifauna species encountered throughout the year	Most of the monitoring will be dealt with in-

	2 Flag and monitor the status of fresh water systems, to determine water bird usage 3 Quantitative survey of any threatened bird species. Would include determination of population sizes, preferred areas and seasonal status	house
Mammals	1 Annual game counts, supplemented by routine observations and recording of mammalian species encountered throughout year 2 Evaluate the introduction of large mammal species to Coutada 5, with special reference to impacts on plant communities, spatial distribution and the viability of the respective translocated groups.	
Plants	1 Routine plant surveys, supplemented by observations and recording of species encountered throughout the year 2 Monitor the effects of both unplanned and management- induced fires and firebreaks 3 Prepare and/or update a vegetation map	The monitoring projects, and preparation of a vegetation map, will be dealt with in-house
Herpetofuana	Routine observations on herpetofauna; update the species list	Most of the monitoring will be done in-house; the assistance of specialists may be enlisted
Freshwater systems and wetlands	1 Undertake a survey of freshwater systems, and associated species 2 Monitor the seasonal status of freshwater wetlands	Most of the monitoring will be undertaken in-house; the assistance of specialists may be enlisted
Sustainable utilisation	1 An assessment of identified plant	The monitoring

	species used for building, medicinal and cultural purposes with special emphasis on providing quantitative guidelines on sustainable utilisation 2 An assessment of the current, and anticipated utilisation of freshwater fish in the freshwater systems of the Coutada (including the Rio Save) with particular emphasis on the allocation of quotas/rights and recognition of the cultural and traditional systems 3 Determine and assess the levels of utilisation of mammalian species, and react accordingly if necessary	will be done in-house
Climate	The establishment and maintenance of automated meteorological monitoring stations, and analysis/dissemination of data for scientific and management purposes.	The stations will be managed and monitored in-house
Social/community		
Attitudes towards Coutada 5	The attitudes of the community at large, but especially the people living outside of Machanga, towards Coutada 5 will be monitored	The monitoring will be done in-house; should tendencies of negative attitudes developing being recorded, specialist assistance may be needed
Resettlement and socio-economic upliftment	Monitor the effectiveness of the resettlement and socio-economic upliftment programs	The monitoring will be done in-house
Community involvement	Monitor the effectiveness of the program of direct community involvement	The monitoring will be done in-house
Health matters	Monitor the general health of the local people, but especially those living outside the town of Machanga	The monitoring will be done in-house; assistance from the health authorities will be enlisted if

		necessary
Utilisation of biodiversity resources	Monitoring the extent of use of biodiversity resources, including terrestrial, freshwater and marine resources	Monitoring will be done in-house
Coutada Community Conservation Committees CCCC and Coutada Community Agricultural Committees CCAC	Monitoring the effectiveness of the CCCC and CCAC committees	Monitoring will be done in-house
Agricultural techniques	Monitoring the implementation and effectiveness of new agricultural techniques	Monitoring will be done in-house; assistance by specialists may be needed; assistance from government institutions will be solicited
Abolishing slash-and-burn agricultural production technique	Monitor the change-over from slash-and-burn cultivation to new production techniques	Monitoring will be done in-house; assistance from government institutions will be needed
Illegal activities	Monitor the incidence of illegal activities: logging; fishing; poaching; bush meat sales. Direct co-operation with official state law enforcement staff	Monitoring will be done in-house; assistance from government institutions will be solicited
Tourism	1 Undertake quantitative and qualitative assessments of the tourism carrying capacity (including private investors), and determination of limits of acceptable changes. 2 Monitoring and evaluation of tourist and site owner's (investors) perceptions on tourism opportunities and activities.	Monitoring will be done in-house
Agriculture		
High-intensity smallholder agricultural projects	Monitor the effectiveness and capacity of new high-intensity	Monitoring will be done in-house;

	agricultural production systems on smallholdings	assistance from government institutions will be solicited
Soil analyses	Undertake a complete analyses of soils in new farmer settlement areas and also where new high-intensity smallholder practises are implemented, to facilitate resettlement and agriculture extension services	The assistance of a retired soils specialist will be enlisted
Pollution		
Water quality/pollution monitoring	Monitor the quality of freshwater systems	The monitoring will be done in-house
Waste	Monitor the effectiveness of in-house and external waste treatment systems	The monitoring will be done in-house
Applied research and monitoring		
Future needs	It will soon become clear in which fields the knowledge of the developers and managers are lacking; these shortcomings may lead to specific research projects being undertaken	These research projects will be outsourced (and funded) by tertiary institutions/NGO's

3.2 DEVELOPMENT OF A RESEARCH AND MONITORING STRATEGY

3.2.1 Identifying a framework

The excellent framework for assessing the effectiveness of management of protected areas, published by the IUCN, provides universal guidelines on the design of monitoring and evaluation strategies. Throughout the investigation leading up to and including this BBP, the following summarised version of the basic framework was adhered to:

".... monitoring and evaluation of protected areas management require that a series of questions be asked relating to:

Design issues- i.e. context (where are we now?) and planning (where do we want to be and how do we get there?)

Appropriateness of management inputs (what do we need?) and processes (how do we go about it?)

Delivery of protected area objectives: Outputs (what did we do and what products were produced?) and outcomes (what did we achieve?)

3.2.2 Terminology and standards

The following definition of terms as used in this document, are based on those of the IUCN:

Evaluation (assessment):

"the judgment or assessment of achievement against some predetermined criteria, usually a set of standards or objectives";

Criterion:

"A major category of conditions or processes- quantitative or qualitative- which together helps defines the six elements of the framework. It is characterized by a set of related indicators"

Indicator

"A measure - quantitative or qualitative - that provides useful information about a criterion"

Monitoring:

'the process of repeated observation, for specified purposes, of one or more elements of the environment (or process of management), according to pre-arranged schedules in space and time and using comparable data collection methods.'

Biological diversity:

In terms of the Convention on Biological Diversity (1992) biological diversity is:

" the variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems"

3.2.3 Proposed management system and structure

(1) Development of a new structure

Monitoring and evaluation focus on the processes and impact of management to effect positive change, therefore the functions, activities and deliverables of the key components had to be defined and presented in an orderly manner and an acceptable management structure and associated functions had to be designed. This aspect is dealt with in Part L above. As will be clear from the proposed structure, most of the RM & E activities will be undertaken in-house

(2) Policy formulation

The mission and objectives as set out by AFWR for Coutada 5, should be regarded as the all encompassing policy directive of the Company. This is the premise on which the agreement with Government is based and emphasizes the intention of AFWR to develop Coutada 5 in accordance with national and internationally recognized conservation principles.

(3) Organisation

The line function/executive management structure for Coutada 5 caters for four distinct management components namely Resource Management, Community Services, Business Enterprises and Tourism. These management components are subordinate to firstly the Management Committee, and ultimately also the Steering Committee. These components all impact on the RM&E strategy.

(4) Staffing

The AFWR staff that will be responsible for, or are involved with, the RM&E strategy is indicated in the abovementioned section of the BBP. The resident specialist support staff will play a major role in this regard.

(5) Funding

AFWR may be in a position to fund at least some of the tasks emanating from the RM & E strategy. However, every effort will be made to solicit donor aid, in order to fund especially those activities and/or responsibilities that do not normally fall in the ambit of a private enterprise.

(6) Planning

Planning is an essential element of the management process and thus also of RM&E. As is evident from this BBP, AFWR will place a premium on proper planning at all levels. Most if not all of these plans will be prepared in-house.

3.3 THE RESEARCH, MONITORING AND EVALUATION STRATEGY

3.3.1 Key indicators

Due to the limited capacity of AFWR to monitor the various activities and maintain the data bases for internal and external evaluations, the number of key indicators, as indicated below, was correspondingly limited.

3.3.2 Management effectiveness

(1) Project launch workshop

The management system of Coutada 5 has, in a short period of time, to be able to effectively implement the BBP, and deal with all the other activities. Most if not all of the external stakeholders, and in particular the resident communities in Coutada 5, have not yet been fully informed on the scope and content of the BBP. It is therefore suggested that once all the priority planning documents have been submitted and approved, a project launch workshop be arranged. The particulars of the workshop and who will attend must still be determined.

Planning action: Prepare a project launch workshop

(2) Internal Monitoring and Evaluation

To maintain the management system that will be followed, as outlined in this BBP, a continuous internal process of monitoring and assessing the various administrative *processes* will be needed. Monitoring will focus on adherence to, and the practicality and effective pursuance of prescriptions taken up in guidelines such as procedure manuals, codes of conduct, financial rules and regulations, the personnel code etc.

Planning action: Prepare an Operational Plan

3.3.3 Biodiversity resource management/interventions

(1) Rationale

The objectives of biodiversity management have been clearly defined above. The basic approach in pursuing these objectives for Coutada 5 can be summed up as follows:

- The terrestrial (and probably also marine and freshwater) systems of Coutada 5 have been exploited for centuries and are no longer pristine (with the exception of most of the vegetative component). The management goal should therefore be to determine the future levels of

exploitation that can be sustained over time, taking into account the needs of the local communities, and the relocated species of wildlife.

- It would be impractical and undesirable to attempt to manage Coutada 5 in isolation. Both the local communities and the neighbouring Coutada 4, and hopefully eventually also Zinave National Park to the south of the Rio Save, will at some time have to come on board in order for Coutada 5 to succeed
- A variety of management interventions will have a positive impact on the biodiversity and status of Coutada 5 and surrounding areas. These include the (probable) resettlement of people living in the core wildlife-wilderness area, to alleviate the pressure on biodiversity in Coutada 5, introduction of species previously known to have inhabited the area, habitat manipulation (for example burning programs), the curbing or prohibiting of unsustainable resource exploitation and educational programs. On the other hand the expected future influx of visitors, and the associated provision of outdoor recreational facilities and infrastructure, may have a detrimental effect if not managed in a responsible and accountable manner. The selected indicators will provide a yardstick for measuring the effectiveness of these interventions and management actions.

(2) Indicators

Planning action: Prepare an Operational plan to deal with the following indicators

Marine: The marine resources along the coast of Coutada 5 have probably been subject to historic over exploitation. Sand oysters, prawns and crabs would be ideal indicator species to determine the success of the marine resources plan. However, monitoring the marine environment may fall outside the scope of Coutada 5's management. Furthermore, the current in-house capacity of AFWR to undertake such surveys is extremely limited.

Terrestrial: For the first five-year cycle it is anticipated that an improvement in habitat due to restricted (or better managed) human pressure would be reflected by those species that bore the brunt of historical human presence and poor agricultural practices. Francolin, guinea fowl, eagles and accipiters, springhares, grey duiker, oribi and steenbok should be monitored as indicators of change. Long-term indicators would obviously include the re-introduced species

Freshwater: A practical "Habitat Integrity Assessment" monitoring system for the freshwater systems of Coutada 5 will have to be drawn up. Unfortunately, AFWR currently has no in-house expertise in this specialized field

3.3.4 Community development indicators

(1) Development and resettlement issues:

The livelihoods of most of the communities residing in Coutada 5 are inextricably linked to, and dependent on, the availability of biodiversity resources. The implementation of the objectives of Coutada 5 will unfortunately, but inevitably, alienate some people from previously-used resources, and will probably cause the relocation of some families, who will have to re-establish (albeit with AFWR assistance) their livelihoods again. Furthermore, the terrestrial biodiversity resources available to the local people on a consumptive basis, will decline, even though a nett increase of these resources will stem from the realization of the AFWR objectives.

(2) Impacts

Project-related impacts on the local people will need to be considered, and integrated in this RM & E program. Some possible impacts are as follows: pressures on public services; health-related impacts, gender-related impacts, impacts on community relations, and impacts on the quality of life.

(3) Resettlement as an indicator

Involuntary resettlement is universally a highly contentious issue and distrust, problems relating to compensation, allocation and quality of land, access to resources and cultural issues are all have the potential to negatively impede on the social development initiative. Successful resettlement has been included as an indicator and part of the M&E program, mainly because it has the potential, if not managed correctly, to be hugely detrimental to realizing the multitude of objectives of Coutada 5

(4) Key social indicators:

To arrive at useful key social indicators that could be used to determine the success of the Coutada 5 rehabilitation and development project, AFWR will have to learn from examples at other projects, for example the Vilanculos Coastal Wildlife Sanctuary.

Planning action: Prepare an Operational plan to deal with the above indicators

3.3.5 Tourism

Some tourism indicators that could be used as part of the RM & E strategy, is as follows: measuring tourism impacts against an inventory of biodiversity assets; measuring community participation in tourism ventures; measuring possible negative tourism-related impacts (for example intra-community friction due to perceived inequities in benefit sharing; social disruption etc); and measuring

positive tourism-related impacts (for example reduced levels of illegal activities due to increased economic security, etc)

3.4 IMPLEMENTING THE MONITORING AND EVALUATION STRATEGY

The RM & E strategy will be implemented according to a yet-to-be-compiled implementation schedule. This schedule will be prepared by the Management Committee and approved by the Steering Committee of the Coutada 5 project. Implementing the RM & E strategy may, for certain activities at least, be dependent on external specialists. It will be endeavored to make maximal use of appropriate tertiary institutions and retired specialists.

Planning action: Prepare an implementation schedule

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INTERIM REPORT ON THE VEGETATION AND FAUNA OF COUTADA 5, SOFALA DISTRICT, MOZAMBIQUE.

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1. INTRODUCTION

A survey of the vegetation and fauna of Coutada 5, Sofala District was commissioned as part of a broader management plan for an integrated landuse programme including the re-introduction of wildlife which formerly occurred in the area. An initial interim survey was undertaken from 9 to 22 June 2013.

1.1 THE STUDY AREA

Coutada 5 lies within the district of Sofala, Central Mozambique. The Coutada extends from the coast inland for approximately 120 km, and borders on Coutada 4 in the west. The southern border is the Rio Save and the northern boundary is approximately 10 km north of the bridge across the Rio Ripembe, with a total area of some 870 000 ha or 8700 km^2 (approximately 1% of the area of Mozambique).

The terrain is mostly flat with a few low rocky ridges in the western half of the area. In the east tidal inlets and channels extend some distance inland and exhibit a dendritic pattern. Areas in between these are covered by a dense growth of mangroves and associated halophytic vegetation. Most of the Coutada is covered by a mosaic of grassland and woodland according to soil moisture relationships.

Apart from the Rio Save which forms the southern boundary of the area, four seasonal rivers are found within the Coutada, ie the Rio Bunga, the R. Muari and the Rio Gorongosa all of which link up with the Rio Ripembe which flows eastwards reaching the Indian Ocean. Apart from pools along these rivers the only other surface water found in the Coutada is restricted to scattered seasonal pans and pits dug by the local inhabitants in some wetland areas.

Anthropogenic activities extend throughout the Coutada differing only in the type of activity, with hunting and palm wine harvesting the primary occupation over most of the area. Human settlements are densest in the east including large villages such as Divinhe and Machanga. Extensive agricultural activities occur along the Rio Save especially in the vicinity of the villages of Javane and Majavane. Some agricultural activity is also

evident at Chitombue but few other areas within Coutada are farmed, these mostly located along the EN1.

Apart from the EN1 which roughly bisects the area there are few roads. Gravel roads extend to the villages of Divinhe and Machanga with tracks leading to Javane and Chitombue. Numerous footpaths crisscross the area mostly used for hunting and palm wine harvesting.

Although the aim of this report was to assess the biodiversity of the area this is hampered by time constraints, by the size of the area, the lack of roads required to reach distant sites as well as an absence of aerial photos from which to map major vegetation types.

2. BIODIVERSITY

In general the biodiversity of the area with the exception of the some faunal groupings is good. Due to the season and some logistical problems it is not possible to make a more in depth statement.

2.1 VEGETATION

In a provisional checklist Da Silva, Izidine & Amude (2004) recorded 3932 indigenous plant species from Mozambique as well as 516 alien taxa. Of the former 177 are regarded as endemic to the country.

The vegetation of the area appears to have substantial species richness, with in excess of 300 plant species recorded to date. However due to the timing of the survey many species were in a state of senescence and therefore difficult or impossible to identify to species or genus level. It is expected that a follow-up visit during summer will provide many additional records as well as confirming current identifications, many of which are at present only to genus level (Table 1, Appendix). Two *Euphorbia* spp. may represent undescribed taxa.

2.2 RARE AND THREATENED PLANTS

According to Isidine and Bandeira (2002) 300 plant species are considered threatened in Mozambique of which approximately 41 have been recorded from Sofala Province (Table 2). Many of these are unlikely to occur in the Coutada due to lack of suitable habitat. During the course of the survey five species including *Searsia refracta* listed as Vulnerable, *Afzelia quanzensis* Lower Risk- least concern, *Xylia torreana* Lower Risk – least Concern, *Millettia stuhlmannii* Lower Risk – least concern and *Pavetta sp. cf catophylla* listed as Data Deficient, were recorded on site. It is likely that more rare and threatened species will be recorded in a follow-up visit.

TABLE 2. RED DATA SPECIES RECORDED AS OCCURRING IN
SOFALA PROVINCE, MOZAMBIQUE (after Izidine &

Bandeira 2002).			
SPECIES	RDB	HABITAT	Family
	STA		
Celosia pandurata	VU	Forest	Amaranth
Lannea stuhlmannii var tomentosa		Widespr	Anacardia
Searsia refracta		Decid.For	Anacardia
Impatiens psychadelphoides ?		Forest	Balsamin
Rourea minor			Connarac
Crassula leachii		Granite	Crassulac
Croton leuconeurus ssp mossambicensis			Euphorbia
Euphorbia plenispina		Lichens	Euphorbia
Acacia torrei		Savanna	Fabaceae
Nesaea spathulata		Wetland	Lythracea
Dorstenia zambesiaca		Forest	Moraceae
Ochna beirensis		Coastal	Ochnacea
Spermacoce kirkii		Coastal	Rubiaceae
Sterculia appendiculata		Forest	Sterculiac
Sterculia quinqueloba		Savanna	Sterculiac
Cordia stuhlmannii	LR-lc	Thicket	Boraginac
Cleome bororensis			Capparac
Dichapetalum barbosae		Savanna	Dichapeta
Jatropha scaposa		Coastal	Euphorbia
Afzelia quanzensis		Forest	Fabaceae
Xylia torreana		Mopane	Fabaceae
Millettia mossambicensis		Widespr	Fabaceae
Millettia stuhlmannii		Widespr	Fabaceae
Milicia excelsa		Riparian	Moraceae
Jamesbrittenia carvalhoi			Scrophula
Cola clavata			Sterculiac
Glyphaea tomentosa		Decid.W	Tiliaceae
Maerua brunnescens	DD	Acacia W	Capparac
Ipomoea consimilis		Savanna	Convolvula
Dichapetalum deflexum		Savanna	Dichapeta
Phyllanthus medoncae		Grasslan	Phyllantha
Eriocaulon infaustum		Wetland	Cyperacea
Adenopodia schlechteri		Thicket	Fabaceae
Triaspis suffulta		Savanna	Malphigiac
Memecylon souzae		Widespr	Melastoma
Eulophia biloba		Coastal	Orchidace
Buchnera namuliensis		Wetland	Scrophular
Coffea zanguebariae			Rubiaceae
Pavetta catophylla		Forest	Rubiaceae

Hermannia micropetala ?			Malvaceae
Grewia hornbyi		Savanna	Tiliaceae
VUL = Vulnerable; LR-lc = Lower Risk - least concern; DD = Data deficient.			

2.3 VEGETATION TYPES

As mentioned previously the vegetation in the area is mostly comprised of woodland, thicket and grassland. Wild & Grandvaux-Barbosa (1967) included a vegetation map of Mozambique as part of a Supplement to Flora Zambesiaca, identifying eight, possibly nine vegetation types present within the area of the Coutada (Table 3). This was simplified by K.Tinley in Smithers & Lobao-Tello (1976) and by Jacobsen & Engelbrecht, this report (Table 3).

TABLE 3. A COMPARISON OF VEGETATION TYPES OCCURRING IN COUTADA 5 ACCORDING TO WILD & GRANDVAUX BARBOSA, TINLEY AND THE CURRENT ASSESSMENT.

Wild & Grandvaux Barbosa 1967	Tinley 1970	Jacobsen & Engelbrecht 2013
Mangrove		Mangrove
Deciduous Dry Miombo	Miombo Savanna	Miombo Savanna
(Lowland Woodland)		
Deciduous Miombo Tree		
Savanna with gregarious dense		
dry woodland.		
Deciduous Miombo Tree		
Savanna (Sublittoral)		
Deciduous Tree Savanna with	Alluvial Grasslands	Grassland/ Hyphaene Palm
Palms (Badly drained Low-		Savanna
land)		
Dry Deciduous Tree Savanna	Acacia Savannas	Mixed Deciduous Woodland
(Lowland)	Mopane Savanna	Mopane Woodland/Scrub
Open Deciduous Tree Savanna		
(Lowland)		
Dry Tall Mixed Thicket (Low-	Tropical Forest and/	Thicket
land)	or Thicket Mosaics	

Dry Tree Savanna - Moist		Riparian Woodland
Grassland - Fringing Forest -		
Aquatic Flora		
Mosaic of Big River Alluviums		Not yet assessed
and Deltas (Lowland, sub-		
littoral)		

It is apparent that several vegetation types occur on Coutada 5 but due to the changes in soils and soil moisture relationships over short distances, many occupy small areas which are impractical to map. A total of seven vegetation types are recognized, all equating to one or other of those mentioned by Wild & Grandvaux-Barbosa and Tinley, the only exceptions being the zone of riparian and aquatic vegetation along the smaller rivers in the area and the Mosaic of Big River Alluviums and Deltas as the latter was not assessed at this time. With the exception of the Save River which forms the southern border of the Coutada, the riparian vegetation on the remaining rivers tends to form narrow zones which extend through one or more of the other vegetation types. Many of the associated species are shared with vegetation communities occurring on the large numbers of termitaria found in the area.

Interim descriptions of the vegetation types and communities recorded during the current survey are incorporated below..

2.3.1 Mixed Deciduous Woodland

This vegetation type covers a large proportion of the area west of the EN1 and is characterized by the large number of tree and shrub species and a dense grass field layer. Species typical of this veld type include *Pseudolachnostylis maprounifolia, Sclerocarya birrea, Terminalia sericea, Burkea africana, Crossopteryx febrifuga, Dicrostachys cinerea, Ozoroa obovata, Hyphaene coriacea, Acacia nigrescens, Vangueria infausta, Albizia versicolor, Vitex mombassae* and *Grewia bicolor* amongst others.
Although there is usually a mixed species composition, monotypic stands of some species such as *Terminalia sericea* and *Acacia* spp. occur.

Grasses are abundant and also of mixed species composition, in particular *Heteropogon contortus, Hyparrhenia spp., Digitaria eriantha, Urochloa mossambicensis, Perotis patens, Eragrostis rigidior* and *Aristida congesta* ssp. *barbicollis*. Grass height is mostly 0,4-1,2 m while aerial and basal cover varies according to grass species present. Few forbs were recorded at the time of the survey.

This vegetation type also has large numbers of bushclumps associated with termite mounds. These communities differ from the vegetation of Mixed Deciduous Woodland as more evergreen species tend to be present, although most also grow scattered in the surrounding woodland. Such bushclumps also vary considerably in species composition

depending on soil moisture relations and many have depressions on one side which form seasonal wetlands. Such communities are characterized by one or more large emergent species such as *Tamarindus indica, Diospyros mespiliformis, Mimusops zeyheri, Acacia burkei, Manilkara mochisa* and *Sideroxylon inerme* together with smaller trees, shrubs and climbers. These include *Antidesma venosum, Zizyphus mucronata, Spirostachys africana, Euclea natalensis, Tricalysia sp., Senna petersiana, Grewia bicolor, G. sulcata, Flagellaria guineense, Asparagus spp., Landolphia kirkii* and *Rhoicissus revoilii*. Grasses such as *Setaria* spp., *Panicum maximum* and *Eragrostis* spp. are often present towards the foot of the mound. Inside the mounds the vegetation cover may be sparse or absent depending on the infiltration of light.

2.3.2 Mopane Woodland/ Scrub

Mopane Woodland/Scrub is comprised of two communities ie Woodland and Scrub/ Grassland, but with *Colophospermum mopane* always forming a substantial part of the vegetation type. Mopane Woodland/scrub also occurs over a large proportion of the area west of the EN1 interdigitating with Mixed Deciduous Woodland. The grass composition is diverse but tends to be the same throughout with local variation according to soil moisture. Grass height varies from short < 30 cm) to tall (1 m) along drainage lines.

2.3.2.1 Woodland

Mopane Woodland tends to be comprised of tall 3-6m, mostly straight stemmed Mopane trees with few other trees such as *Combretum hereroensis, Terminalia sericea, Combretum apiculatum, Ormocarpum trichocarpum, Gardenia volkensii, Piliostigma thonningii, Crossopteryx febrifuga, Acacia nilotica, A. nigrescens* and *Dalbergia melanoxylon*. Shrubs are few mostly *Cissus cornifolia, Combretum hereroensis* and *Asparagus* sp. except on termitaria, with a grass dominated field layer. An epiphytic orchid *Ansellia africana* grows on Mopane trees.

Grasses are varied including *Panicum sp., Pogonarthria squarrosa, Brachiaria serrata, Hyparrhenia spp., Eragrostis superba, Heteropogon contortus* and *Digitaria eriantha*. A sedge *Cyperus obtusiflorus* may be common in the field layer. Grass height varied from 0,40 -1m.

Termitaria in Mopane are often dominated by *Grewia bicolor* and *Ximenia americana,* but other species such as *Searsia refracta, Pappea capensis, Tricalysia sp., Gymnosporia buxifolia, Adenium obesum* and *Vangueria* sp. may also be present. Grasses include *Panicum maximum*.

2.3.2.2 Scrub/Grassland

In contrast Mopane Scrub/Grassland is comprised of scattered low growing Mopane shrubs rarely reaching 1m in height, often together with shrubby *Combretum hereroensis, Ormocarpum trichocarpum, Acacia nilotica* and *Ximenia americana* in a short to medium

tall grassland mostly of mixed species composition. Grass species include *Heteropogon contortus, Trachypogon spicatus, Cymbopogon excavatus, Brachiaria serrata, Digitaria eriantha, Aristida congesta ssp. barbicollis* and *Pogonarthria squarrosa*. A sedge, *Bulbostylis hispidula* is a common constituent while forbs are sparsely represented by a few species such as *Blepharis subvolubilis, B. sp., Agathisanthemum bojeri* and an *Indigofera* sp.

2.3.3 Riparian Woodland

The Riparian zones along the rivers vary from strips 10 - 50 m wide along the Bunga and other rivers to 100 m or more along the Save River. The trees along the river bank are tallest forming an almost closed canopy but is more open away from this narrow zone, similar to that along the Save River, with smaller trees and shrubs growing between the larger trees. Grasses tend to be clumped and tallest under the trees.

Tree species are mixed and vary in height from approximately 5 -20 m, the largest trees being found along the Save River. Species include *Albizia versicolor, A. glaberrima, Kigelia afiricana, Combretum imberbe, Afzelia quanzensis, Trichilia dregeana, Ficus sycamorus, Philenoptera violacea, Terminalia sericea, Hyphaene coriacea, Combretum apiculatum, Acacia robusta, Tabernaemonata elegans, Piliostigma thonningii, Mimusops zeyheri, Garcinia livingstonei, Markahamia zanzebarica* and others.

Shrubs are varied including *Maerua juncea, Grewia bicolor, G. inaequilatera, G. leptopetala, G. sulcata, Hyphaene coriacea, Thilachium africanum, Gymnosporia senegalensis, Capparis sepiaria, Acacia nilotica, Vernonia colorata* and *Searsia gueinzii* amongst others.

Grasses vary with *Panicum maximum* and *Digitaria* sp. in the Save riparian. Closer to the water, along both the Bunga and Muari Rivers, *Vetiveria nigritana* forms large tussocks with *Phragmitis mauritianus* in or adjacent to the water.

In the shallows the forb *Ludwigia pubescens* formed extensive monotypic clumps. Climbers such as *Tacazzea apiculata, Paederia bojeriana, Combretum microphyllum, Jasminum sp, Cissus rotundifolius* and *Pergularia daemia* are common to abundant.

2.3.4 Grassland/ Hyphaene Palm Savanna

Most of the area comprising this vegetation type is seasonal wetland and lies east of the EN1 between the Mangroves along the seashore and the Miombo, Thicket and Mixed Deciduous vegetation further west.

This vegetation type is dominated by grasses and *Hyphaene coriacea* palms, the former predominating. Sparsely scattered bushclumps also occur dominated by woody species.

In the north closer to the Gorongoza River a small area of this veld type was characterized by short grasses, with a poor aerial and basal cover. Grasses such as

Sporobolus iocladus and *Digitaria eriantha*, a sedge *Bulbostylis hispidula* and a forb *Vernonia* sp.dominated open areas between clumps of palms with a *Sesbania* sp. also present.

Around clumps of *Hyphaene*, forbs and shrubs were also recorded especially on mounds. These included *Albizia antunesii, Schotia brachypetala, Dicrostachys cinerea, Commiphora glandulosa,, Sideroxylon inerme, Gymnosporia senegalensis, Zizyphus mucronata, Ehretia amoena,Sarcostemma viminale, Cissus rotundifolia, Justicia sp., Celosia* sp. and *Hibiscus cannabinus* among others.

Further south in the vicinity of Devinhe, medium to tall grasses including *Hyparrhenia* spp, *Trachypogon spicatus, Ischaemum fasciculatum, Heteropogon contortus, Hyperthelia dissolute, Imperata cylindrica, Eragrostis amoena* and *Panicum* sp. amongst others dominated the field layer with scattered clumps of *Hyphaene coriacea*. Some small trees such as *Parinari curatellifolia, Syzygium guineense* and *Annona senegalensis* were recorded but more woody species grew on termitaria forming bushclumps. These include *Albizia versicolor, Pseudolachnostylis maprouneifolia,, Garcinia livingstonei, Pappea capensis, Phoenix reclinata, Sideroxylon inerme, Spirostachys africana, Lantana camara* and *Strychnos madagascariensis* among others. *Flagellaria guineensis* and *Abrus precatorius* climbed into the woody species. The level of water in a pit was approximately 1,5m below the surface.

Fringing the Save River riparian is a grass dominated wetland primarily of ?*Eriochloa stapfianus* (to be confirmed) as well as *Bothriochloa radicans* with Fever Trees *Acacia xanthophloea*, much of which towards Majavane and Javane has been cultivated.

2.3.5 Miombo with Bushclumps

Miombo with numerous termitaria and associated bushclumps, interspersed with areas of short to medium tall grassland is mostly present east of the EN1, integrating with patches of thicket. Soils appear to be of a more sandy nature than is the case west of the EN1.

Miombo is characterized by the presence of clumps of *Julbernadia globiflora* as well as, but less common, *Brachystegia spiciformis*. Patches of woodland with *Brachystegia bussei* dominant are also found. Few trees occur in the grassland between bushclumps these including *Hyphaene coriacea* and *Crossopteryx febrifuga*. Grasses predominate imcluding *Hyparrhenia* spp., *Aristida congesta* ssp *barbicollis, Ischaemum fasciculatum* and *Brachiaria serrata* together with a few forbs such as *Buchnera* sp., *Indigofera* sp., *Eriosema psoraleoides* and *Cycnium tubulosum*. The grassland has a poor aerial and basal cover with relatively low grazing potential.

The bushclumps on termitaria are more species rich and usually characterized by one or two tall emergent trees. Apart from *Julbernadia*, other species include *Brachystegia bussei, B. spiciformis, Mimusops zeyheri, Mundulea sericea, Catunaregam obovata, Vangueria* sp., *Ochna* sp. cf *natalitia, Dalbergia melanoxylon, Gardenia volkensii, Searsia gueinzii, Euclea divinorum, Lannea schweinfurthiii, Sideroxylon inerme,*

Strychnos madagascariensis, Mystroxylon aethiopicum, Diospyros mespiliformis and *Thilachium africanum*. Climbers include *Landolphia kirkii* and *Cissus rotundifolius.*

The species composition of such bushclumps varies from clump to clump but many component species occur throughout.

2.3.6 Thicket

Clumps or areas of thicket are widespread and some may be extensive in area. The species composition and structure of the vegetation differs from that of the other veld types although some of the component species may also occur elsewhere. Tall emergent trees may occur but thickets are characterized by a more dense growth of smaller trees and shrubs and a poorer field layer. Three basic communities are apparent as follows:

2.3.6.1 *Androstachys johnsonii* Thicket

Msimbiri *Androstachys johnsonii* forms dense almost monotypic thickets throughout the Coutada. Such thickets are mostly small. Often tall emergents such as *Brachystegia bussei* occur within or on the margins of such thickets as well as other woody species such as *Euclea divinorum, Sideroxylon inerme, Manilkara mochisa, M. discolor, Rhigozum zambesiacum, Acacia burkei, Carissa tetramera, Craibia zimmermannii, Zizyphus mucronata, Pappea capensis, Olax dissitiflorus, Mystroxylon aethiopicum, Vepris reflexa, Ximenia Americana, Maerua decumbens and Euclea natalensis, Thilachium africanum, Croton pseudopulchellus* and others. Climbers include *Strophanthus* sp. and *Landolphia kirkii*.

The field layer is mostly bare under Msimbiri with grasses only present in open areas where light can penetrate, and around the perimeter where sunlight reaches the ground. Grasses such as *Digitaria eriantha, Sporobolus fimbriatus, Eragrotis gummiflua, Heteropogon contortus* and *Aristida congesta* ssp. *barbicollis* were recorded. A *Commelina* sp. was the only forb recorded.

2.3.6.2 Mixed Deciduous Thicket

Most of the thickets can be considered to be Mixed Deciduous Thicket which consists of emergent trees, mostly *Brachystegia bussei*, sometimes together with *Adansonia digitata*. Most of the trees and shrubs are deciduous species and it appears likely that all of the areas with trees devoid of any foliage as seen from aerial reconnaissance of the area, form part of this vegetation community. In the vicinity of the aptly-named Baobab Grove woody species included *Pteleopsis myrtifolia, Strychnos spinosa, S. madagascariensis, S. potatorum, Cassia abbreviata, Crossopteryx febrifuga, Monotes glaber, Diospyros mespiliformis, Grewia bicolor, Hippobromus pauciflorus, Xylia torreana, Vitex mombassae, Hyphaene coriacea, Sclerocarya birrea, Markhamia zanzebarica, Phyllanthus reticulatus, P. pinnatus, Capparis sepiaria, Combretum apiculatum, Acacia nigrescens, A. robusta, Thilachium africanum, Gymnosporia senegalensis* and others.

The field layer includes stands of *Ocimum americanum* and in more open areas grasses such as *Heteropogon contortus, Eragrostis rigidior, Urochloa mossambicense,* and *Digitaria eriantha*.

2.3.6.3 Rocky Outcrops Thicket

Few areas of Rocky Outcrop Thicket is present in the area, all on few low hills formed by outcrops of a silcrete or conglomerate. Two towards the western boundary of the area (one may be part of Coutada 4) appear to be covered by Msimbiri while one in the vicinity of Buffalo Camp has Msimbiri along the rocky slopes with mixed deciduous thicket on the crest. The latter appears to be of particular importance in that several species have only been recorded here and nowhere else.

Baobab *Adansonia digitata* is common on the crest together with *Brachystegia bussei*. Other woody species include *Manilkara mochisa, Boscia albitrunca, Colophospermum mopane, Strychnos madagascariensis, Monotes glaber, Catunaregam obovata, Acacia burkei, Androstachys johnsonii, Phyllanthus pinnatus, Gardenia resiniflua, Thilachium africanum, Diospyros mespiliformis, Commiphora glandulosa, Dalbergia sp., Xylia torreana, Grewia flavescens* and *Euphorbia lividiflora*.

Numerous climbers such as *Strophanthus* sp., *Cissus rotundifolius, C. quadrangularis, Rhoicissus revoilii, Asparagus falcatus* and *Landolphia kirkii* are present. The field layer includes two *Euphorbia* spp., one of which, together with a *Huernia* sp. and *Plectranthus tettensis* is associated with rocky outcrops, *Asparagus* sp., *Waltheria indica*, *Commelina* sp., *Barleria saxatilis, Hibiscus cannabinus, Kalanchoe* sp. cf *rotundifolia* with *Stylochaeton natalensis* among rocks on the slope.

2.3.7 Mangroves

The Mangroves formed a relatively narrow zone along the inlet at Divinhe, behind which was a narrow zone of thicket vegetation. The mangroves comprised three species namely White Mangrove *Avicennia marina*, Black Mangrove *Bruguiera gymnorhiza* and Red Mangrove *Rhizophora mucronata*. Due to tidal action the field layer was bare with the exception of swards of a halophytic grass *Sporobolus virginicus* which grew on raised mounds. Adjacent to the mangroves but higher up the bank many other species were recorded including *Salvadora persica, Capparis sepiaria, Sideroxylon inerme, Ekebergia capensis, Manilkara mochisa, Gymnosporia sp., Euclea natalensis, Sclerocarya birrea, Acacia burkei, Pappea capensis, Thilachium africanum, Olax dissitiflora, Searsia gueinzii, Tamarindus indica, Anisotes formosissimus* and *Zizyphus mauritiana*. *Cissus rotundifolia* grew over the shrubs and low trees.

Outside of the thicket, grass, mostly *Setaria* sp. was recorded. Other forbs included *Sansevieria concinna, Cocculus hirsutus, Abutilon* sp., *Asparagus* sp., *Rhynchosia* sp. cf *caribaea* and *Justicia flava*.

2.4 FAUNA

The most striking part of the survey was the apparent absence of wildlife. Some of this can be ascribed to the time of the year of the interim assessment, but mostly a result of past and prsent anthropogenic activities, with hunting camps occurring throughout much of the Coutada especially in the western half. Annual uncontrolled fires over large areas of Coutada 5 have no doubt exacerbated the situation. The following fauna was recorded as being present on the Coutada, including incidental observations made by personnel at Buffalo Camp during the day and during night drives with spotlights, prior to this survey.

2.4.1 Mammals

Few mammals were recorded in the Coutada and of those, with some exceptions, densities were low. These included sight records as well as spoor and faeces confirmation (Table 4 Appendix). It appears that hares are still relatively common and widespread. According to Smithers & Lobao Tello (1970) it is possible that two species, the Scrub Hare *Lepus saxatilis* and the Cape Hare *Lepus capensis*, may be present with the latter preferring open grassy areas, the former more wooded sites.

Small numbers of Impala *Aepyceros melampus*, Kudu *Tragelaphus strepsiceros* and Nyala *T. angasi* as well as Grey Duiker *Sylvicapra grimmia*, Oribi *Ourebia ourebi* and Suni *Nesotragus moschatus* are still present, while Hippopotamus *Hippopotamus amphibius* occur along the Rio Save. There is an absence of larger predators as is to be expected with such a low prey base. What was surprising is that apart from genets, there is an absence of smaller carnivores such as mongooses and wild cats.

Baboons *Papio ursinus* were also seen on several occasions while the calls of the Thick-tailed Bushbaby *Otolemur crassicaudatus* were frequently heard during the night.

Rodent activity was also found to be very low with only three species (six individuals) captured and released in 130 trap nights. These included the Bushveld Gerbil *Tatera leucogaster*, Spiny mouse *Acomys spinosissimus* and Multimammate Mouse *Mastomys natalensis*. This is a capture rate of 4,6% which is very low. It is difficult to ascribe this to any specific factor but the preponderance of veld fires comes to mind as there is no cover for such animals following the advent of such fires making them vulnerable to predation. It was noteworthy that no rodent paths were seen despite the relatively dense aerial grass cover seen in some areas indicating an absence of diurnal rodents, substantiated by only capturing nocturnal species. Due to time constraints and logistics it was not possible to cover much of the area.

Within thickets the paths of the Four-toed Elephant Shrew *Petrodromus tetradactylus*, the largest of the southern African species, were noted.

None of the species recorded are threatened according to IUCN criteria (Friedmann & Daly 2004).

2.4.2 Avifauna

Due to the large area and distances traveled it was only possible to make incidental observations together with those recorded by other members of the assessment team and the staff of the Coutada. Birds were not abundant in the Coutada, in particular the absence of game birds such as francolin, spurfowl and both species of guineafowl was noticeable. Table 5 lists the birds recorded. Amongst the most frequent birds seen were Gabar (*Micronisus gabar*)and Dark Chanting Goshawks (*Melierax metabates*) and Lilac-breasted Rollers *Coracias caudata* while Bateleurs *Terathopius ecaudatus* were seen closer to the Save River and Gymnogene along the Bunga River. No ducks or other waterfowl were recorded along pools in the latter and Muari Rivers.

Wattled Crane *Grus carunculatus* listed as Critically Endangered according to IUCN criteria (Barnes 2000), was recorded near Devinhe on a previous visit to the area (A. von W. Lambrechts pers comm.). This may be of international importance for this endangered species should there be a breeding population here.

2.4.3 Herpetofauna

Due to the timing of the initial survey few reptiles were seen but the area is likely to be rich in numbers of species (Table 6). Some lizards such as Cape Dwarf Gecko *Lygodactylus capensis*, Flat-headed Tropical House Gecko *Hemidactylus platycephalus*, Striped Skink *Trachylepis striata*, Variable Skink *T. varia*, Common Rough-scaled Lizard *Ichnotropis squamulosa*, Peters' Ground Agama *Agama armata* and Common Chameleon *Chamaeleo dilepis* were recorded. A Skink *Trachylepis* sp. occurring in Mopane Scrub/ Grassland, and related to the Variable Skink, appears to be an undescribed taxon.

The Cape Dwarf Gecko *Lygodactylus capensis* is a widespread species occupying dead trees and branches on the ground, but was only recorded within Msimbiri *Androstachys johnsonii* clumps which appear to offer some refuge from wildfires, which ravage the area outside of such clumps.

Tracks of snakes were seen but none recorded. According to the staff at Buffalo Camp, the Southern African Python *Python natalensis* has been seen in the vicinity.

Crocodiles *Crocodylus niloticus* were seen along the Rio Save as well as along the lower Muari River.

Amphibians were seen along the banks of waterbodies, mostly immature and therefore difficult to identify. Only one species, likely the Common River Frog *Amietia angolensis* was recorded and several Puddle Frogs (*Phrynobatrachus* spp.) were also seen, but require a more in depth assessment.

With the exception of the Southern African Python *Python natalensis* which is listed in South Africa as Vulnerable (Branch 1988), none of the reptiles or amphibians recorded to date is rare or threatened.

2.4.4 Invertebrata

Similar to that experienced for most of the fauna, the invertebrate richness, with the exception of butterflies appeared to be poor. Butterflies were numerous despite the timing of the survey and several species were recorded (Table 7). However, due to time constraints it was not possible to survey them in greater detail. None of the species recorded are rare or threatened.

Other invertebrates included juliform millipedes such as *Doratogonus* sp. but few were seen. A scorpion of the genus *Opisthocanthus* sp. was also recorded from under the bark of a log in a stand of Msimbiri.

In the vicinity of water numerous dragonflies such as the Violet Dropwing *Trithemis annulata* and Damselflies were seen, the latter including the Common Citril *Ceriagrion glabrum*, an orange species.

Some spiders were seen including Flatties *Anyphops* spp. and a Baboon Spider possibly of the genus *Augacephalus* or Star-burst Baboon Spiders, the name likely derived from the pattern on the thorax of these spiders..

3. DISCUSSION

It appears that the vegetation of the area comprises a fire subclimax, most species with the exception of evergreen trees and shrubs being deciduous and resistant to fire, resprouting following the passage of a burn. Those that are not resistant are killed off. Without fire it is likely that there will be an increase in fire sensitive species with larger areas of thicket or closed canopy woodland.

The absence of any moribund material indicates that veld fires are frequent. Despite this the grass sward is still good, but largely comprised of ‘sour’ less palatable species. Grasses such as *Hyparrhenia* spp., *Hyperthelia dissoluta* and *Heteropogon contortus* may have increased as a consequence, with less robust tussock species declining. Especially in areas of scrub Mopane, basal cover is poor.

Frequent fires may affect evergreen species and reduce the extent and structure of riparian zones as well as bushclumps. Due to the frequency of fires and denudation of the vegetation, the soils are exposed to the sun and as a result are baked hard and are capped with a hard layer inhibiting seedling survival. Such fires tend to occur during the dry winter months stimulating the grass to grow at a time when soil moisture is at its lowest with the result that less robust species do not survive the hottest and driest months in spring, preceding the rains. Although some nutrients do return to the soil following fires,

this does not replace the nutrients derived from rotting material and associated protective cover of the soil as well as retaining moisture following rains for longer periods of time.

The vegetation of the Coutada is currently totally under utilized due to a lack of herbivores. This includes both browsers and grazers. The absence of grazing animals promotes the establishment of more fire resistant grasses at the expense of more palatable but less fire resistant species. Following a burn herbivores tend to graze on the newly emerged grasses including those of lower palatability. Frequent fires do not allow for a build up of combustible material with the result that bush encroachment can take place.

Faunally the Coutada appears to be poor, particularly with regard to mammals. If one compares the distribution maps in Smithers & Lobao Tello (1976) to current conditions, it is apparent that many species, in particular larger mammals, carnivores and even smaller species, are now absent, although there was a marked absence of records of many species in the area between the Rio Save and Beira, at that time. This has been substantiated during the current cursory assessment. It is noteworthy that were no records of Giraffe *Giraffa camelopardalis* in the Coutada at that time. It appears that they were restricted to areas of low rainfall ie below 700 mm/ annum.

Apart from genets and White-tailed Mongoose no signs of other small carnivore was recorded. Rodents appear to have a low abundance and no signs of runways were seen. The lack of a dense basal cover will affect many species of fauna including invertebrates, game birds, diurnal rodents such as Vlei Rats *Otomys* spp., Striped Field Mouse *Rhabdomys pumilio* and Single Striped Mouse *Lemniscomys rosalia* as well as reptiles which form the prey of many diurnal birds of prey, carnivores and other reptiles.

4. SPECIAL PRESERVATION AREAS

Preliminary observations indicate that the Rocky ridges and outcrops which occur at Buffalo Camp and westwards, as well as Riparian zones, Termitaria and Pans fall within what could be construed as having a higher conservation value than the remainder of the area. The Rocky ridges are very restricted in extent, have plant species and communities which are absent from the greater Coutada. Similarly the Riparian zones, Bushclumps and Pans are also limited in extent and are important refugia for many faunal species as well as exhibiting unique plant communities.

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APPENDIX
TABLE 1. A PRELIMINARY CHECKLIST OF THE VEGETATION OF COUTADA 5, SOFALA DISTRICT, MOZAMBIQUE.

Marsiliaceae

MARSILEA L.
 sp.

MONOCOTYLEDONAE
Araceae

STYLOCHAETON Lepr.
 natalensis Schott

Arecaceae

HYPHAENE Gaertn.
 coriacea Gaertn.
PHOENIX L.
 reclinatus Jacq.

Asparagaceae

ASPARAGUS L.
 falcatus L.
 setaceus
 sp. cf cooperi Bak.
 sp. (mopane)

sp.
sp. (mangrove)
sp. 2 (mangrove)
sp. 3 (salt pan)

Asphodelaceae

ALOE L.
chabaudii Schonland

Commelinaceae

COMMELINA L.
sp.

Cyperaceae

BULBOSTYLIS Kunth
Hispidula (Vahl) H.W.Haines
sp.
CYPERUS L.
congestus Vahl
obtusiflorus Vahl var. obtusiflorus
prolifer Lam.
sphaerospermus Schrad.
sp.
sp. 2
ELEOCHARIS R.Br.
acutangula (Roxb.) Schult.
FUIRENA Schrad.
pubescens (Poir.) Kunth
SCHOENOPLECTUS (Rchb.) Palla
muriculatus (Kuk) J. Browning

Dioscoreaceae

DIOSCOREA L.
sp.

Dracaenaceae

SANSEVIERIA Thunb.
concinna N.E.Br.
hyacinthoides (L.) Druce

Flagellariaceae

FLAGELLARIA L.
 guineensis Schumach.

Hypoxidaceae

HYPOXIS L.
 sp. cf rigidula Baker

Juncaceae

JUNCUS L.
 acutus

Orchidaceae

ANSELLIA Lindl.
 africana Lindl.

Poaceae

ANDROPOGON L.
 schirensis A. Rich.
ARISTIDA L.
 adscensionis L.
 congesta Roem. ex Schult. ssp barbicollis (Trin. & Rupr.) De Winter
 sp. cf meridionalis Henrard
BOTHRIOCHLOA Kuntze
 radicans (Lehm.) A. Camus
BRACHIARIA (Trin.) Griseb.
 serrata (Thunb.) Stapf
 sp. cf brizantha (A.Rich.) Stapf
CYMBOPOGON Spreng
 excavatus (Hochst.0 Stapf ex Burtt Davy
DACTYLOCTENIUM Willd.
 gemminatum Hack.
DIGITARIA Haller
 eriantha Steud.
 sp. cf diagonalis (Nees) Stapf
 sp.
DIHETEROPOGON (Hack.) Stapf
 amplectens (Nees.) Clayton
ECHINOCHLOA P.Beauv.
 sp. cf holubii (Stapf) Stapf
ERAGROSTIS Wolf
 amoena K. Schum.

chapelieri (Kunth) Nees
gummiflua Nees
rigidior Pilg.
superba Peyr.
sp. wetland Divinhe)
sp. wetland
sp. (termitaria)
HETEROPOGON Pers.
contortus (L.) Roem. & Schult.
HYPARRHIA E. Fourn.
dichroa (Steud.) Stapf
filipendula (Hochst.) Stapf
HYPERTHELIA Clayton
dissoluta (Nees) Steud. ex Clayton
IMPERATA Cirillo
cylindrica (L.) Reusch.
ISCHAEMUM L.
fasciculatum Brongn.
OXYTENANTHERA Munro
abyssinica (A.Rich.) Munro
PANICUM L.
deustum Thunb.
maximum Jacq.
sp.
PASPALIDIUM Stapf
obtusifolium (Delile) N.D. Simpson
PEROTIS Aiton
patens Gand.
PHRAGMITES Adans.
mauritianus Kunth
POGONARTHRIA Stapf
squarrosa (Roem. & Schult.)Pilg.
SETARIA P. Beauv.
sphacelata (Schum.) Moss ssp sphacellata
sp. (wetland) (? Eriochloa stapfiana)
sp. (termitaria)
SPOROBOLUS R.Br.
fimbriatus (Trin.) Nees
iocladus (Trin.) Nees
virginicus (L.) Kunth
TRACHYPOGON Nees
spicatus (L.f.) Kuntze
UROCHLOA P.Beauv.
mossambicensis (Hack.) Dandy
VETIVERIA Bory
nigritana (Benth.) Stapf

Typhaceae

TYPHA L.
 capensis (Rohbr) N.E.Br.

DICOTYLEDONAE
Acanthaceae

ANISOTES Nees
 formosissimus (Klotzsch) Milne-Redh.
BARLERIA L.
 saxatilis Oberm.
BLEPHARIS Juss.
 cf subvolubilis C.B.Clarke
 sp. 1
 sp. 2 (wetland)
HYPOETES Sol. ex R.Br.
 sp.
JUSTICIA L.
 flava (Vahl) Vahl
 sp.

Amaranthaceae

ACHYRANTHES L.
 aspera L.
CELOSIA L.
 sp.
CYATHULA Blume
 uncinulata(Schrad.) Schinz
GOMPHRENA L.
 celosioides Mart.
KYPHOCARPA (Fenzyl) Lopr.
 angustifolia (Moq.) Lopr.
PUPALIA Juss.
 lappacea (L.) A. Juss. var. lappacea

Anacardiaceae

LANNEA A. Rich.
 schweinfurthii (Engl.)Engl.var stuhlmannii (Engl.) Kokwaro
OZOROA Delile
 obovata (Oliv.) R.Fer.& A.Fern var obovata
 sp.
SCLEROCARYA Hochst.

birrea A. (Rich.) ssp. caffra (Sond.) Kokwaro
SEARSIA
gueinzii Sond.
refracta Eckl. & Zeyh.

Annonaceae

ANNONA L.
senegalensis Pers.
ARTABOTRYS R.Br.
brachypetalus Benth.
? CLEISTCHLAMYS Oliv.
kirkii (Benth.) Oliv.
HEXALOBUS A.DC
sp.
MONANTHOTAXIS Baill.
caffra (Sond.) Verdc.
UVARIA L.
sp.

Apocynaceae

ADENIUM Roem.& Schult.
multiflorum Klotzsch
CARISSA L.
tetramera (Sacleux) Stapf
DIPLORHYNCHUS Welw.ex Ficalho & Hiern
condylocarpon (Mull.Arg.) Pichon.
LANDOLPHIA Beauv.
kirkii T-Dyer ex Hook.f.
PERGULARIA L.
Daemia (Forssk.) Chiov.
SARCOSTEMMA R.Br.
viminale (L.) R.Br.
SECAMONE R.Br.
alpinii Schult.
filiformis (L.f.) J.H.Ross
STROPHANTHUS DC
sp.
TABERNAEMONTANA L.
elegans Stapf
TACAZZEA Decne.
apiculata Oliv.

Asteraceae

ECLIPTA L.
 prostrata (L.)L.
PLUCHEA Cass.
 dioscoridis (L.) DC
VERNONIA Schreb.
 colorata (Willd.) Drake
 sp.

Avicenniaceae

AVICENNIA L.
 marina (Forssk.) Vierh.

Bignoniaceae

MARKHAMIA Seem. ex Baill.
 zanzibarica (Bojer ex DC) K.Schum.
KIGELIA DC
 africana (Lam.) Benth.
RHIGOZUM Burch.
 zambesiacum Baker

Boraginaceae

EHRETIA P. Browne
 amoena Klotzsch

Bombacaceae

ADANSONIA L.
 digitata L.

Burseraceae

COMMIPHORA Jacq.
 glandulosa Schinz

Campanulaceae

WAHLENBERGIA Schrad. ex Roth.
 sp.

Capparaceae

BOSCIA Lam.
 albitrunca (Burch.) Gig. Ex Gilg-Ben. var albitrunca

CAPPARIS L.
 sepiaria L.
MAERUA Forssk.
 edulis (Gilg. & Gilg.-Ben) DeWolf
 juncea Pax
 nervosa (Hochst.) Oliv.
THILACHIUM Lour.
 africanum Lour.

Celastraceae

ELAEODENDRON Jacq.
 transvaalense (Burtt Davy) R.H.Archer
GYMNOSPORIA (Wight & Arn.) Hook.f.
 buxifolia (L.) Szyszyl)
 senegalensis (Lam.) Loes.
 sp.
MYSTROXYLON Eckl. & Zeyh.
 aethiopicum (Thunb.) Loes. subsp. schlechteri (Loes.) R.H.Archer

Chrysobalanaceae

PARINARI Aubl.
 curatellifolia Planch. Ex Benth.

Clusiaceae

GARCINIA L.
 livingstonei T. Anderson

Combretaceae

COMBRETUM Loefl.
 apiculatum Sond.
 hereroense Schinz
 imberbe Wawra
 microphyllum Klotzsch
 mossambicense (Klotzsch) Engl.
PTELEOPSIS Engl.
 myrtifolia M.A.Lawson) Engl. & Diels
TERMINALIA L.
 sericea Burch. ex DC

Convolvulaceae

CONVOLVULUS L.

sp.
XENOSTEGIA D.F. Austin & Staples
tridentata (L.) D.F. Austin & Staples ssp. angustifolia (Jacq.) Lejoly & Lisowski

Crassulaceae

KALANCHOE Adans.
brachyloba Welw. ex Britten

Cucurbitaceae

MOMORDICA L.
balsamina L.

Dipterocarpaceae

MONOTES A.DC.
sp. cf africanus A.DC.

Ebenaceae

DIOSPYROS L.
mespiliformis Hochst. & A.DC.
EUCLEA Murray
divinorum Hiern
natalensis A.DC.

Euphorbiaceae

ALCHORNEA Sw.
Laxiflora (Benth.) Pax & Hoffm.
ANDROSTACHYS Prain
johnsonii Prain
ANTIDESMA L.
venosum E. Mey. Ex Tul.
BRIDELIA Willd.
cathartica G.Bertol. ssp. cathartica
? CLEISTANTHUS Hook. f. ex Planch.
schlechteri (Pax) Hutch.
CROTON L.
pseudopulchellus Pax
EUPHORBIA L.
ingens E.Mey. ex Boiss.
lividiflora L.C. Leach
tirucallii L.
sp.

sp.
sp. (non spinose)
FLEUGGEA Willd.
virosa (Roxb. Ex Willd.)
PHYLLANTHUS L.
Maderaspatensis L.
pinnatus (Wight) G.L.Webster
reticulatus Poir.
PSEUDOLACHNOSTYLIS Pax
maprouneifolia Pax var maprouneifolia
SHIRAKIOPSIS Esser
elliptica (Hochst.) Esser
SPIROSTACHYS Sond.
africana Sond.
SUREGADA Roxb. ex Rottler
zanzibariensis Baill.
SYNADENIUM Boiss.
kirkii (N.E.Br.) S. Carter

Fabaceae

ABRUS Adans.
precatorius L. ssp africana
ACACIA Mill.
burkei Benth.
erubescens Welw. ex Oliv.
nigrescens Oliv.
cf natalitia E.Mey.
nilotica (L.) Willd. ex Delile ssp. kraussiana (Benth.) Brenan
robusta Burch.
senegal (L.) Willd. var rostrata Brenan
xanthophloea Benth.
AFZELIA Sm.
quanzensis Welw.
ALBIZIA Durazz.
antunesiana Harms
glaberrima (Schumach. & Thonn.) var. glabrescens (Oliv.) Brenan
petersiana (Bolle) Oliv.
versicolor Welw. & Oliv.
AMBLYGONOCAPUS Harms
andongensis (Welw. ex Oliv.) Exell & Torre
BRACHYSTEGIA Benth.
bussei Harms
spiciformis Benth.
BURKEA Benth.
africana Hook.

CASSIA L. amended Gaertn.
 abbreviata Oliv.
CHAMAECHRISTA Moench
 absus (L.) Irwwin & Barneby
 mimosoides (L.) Greene
COLOPHOSPERMUM J.Kirk ex J. Leonard
 mopane (J.Kirk ex Benth.) J.Kirk ex J.Leonard
CRAIBIA Harms & Dunn
 zimmermannii (Harms) Dunn
CROTALARIA L.
 sp. cf monteiroi Taub. Ex Baker
DALBERGIA L.f.
 melanoxylon Guill. & Perr.
DESMODIUM Desv.
 sp.
DICROSTACHYS (A.DC.) Wight & Am.
 cinerea (L.) Wight & Am.
ERIOSEMA (DC.) G. Don
 psoraleoides G. Don
 sp.
INDIGOFERA L.
 sp.
 sp. 2
 sp. 3
JULBERNADIA Pellegr.
 globiflora (Benth.) Troupin
MILLETIA Wight & Am.
 stuhlmannii Taub.
MIMOSA L.
 pigra L.
MUNDULEA (DC.) Benth.
 sericea (Willd.) A. Chev.
NEWTONIA Baill.
 hildebrandtii (Vatke) Torre
ORMOCARPUM P.Beauv.
 trichocarpum (Taub.) Engl.
PELTOPHORUM (Vogel) Benth.
africanum Snd.
PHILENOPTERA Fenzl. ex A. Rich.
 violacea (Klotzsch) Schrire
PILIOSTIGMA Hochst.
 thonningii (Schumach.) Milne-Redh.
PTEROCARPUS Jacq.
 angolensis DC.
RHYNCHOSIA Lour.
 totta (Thunb.) DC.

sp. cf caribaea (Jacq.) DC.
sp.
SCHOTIA Jacq.
brachypetala Sond.
SENNA Mill.
petersiana (Bolle) Lock
SESBANIA Scop.
sp.
TAMARINDUS L.
indica L. *
TEPHROSIA Pers.
longipes Meisn.
purpurea (L.) Pers.
VIGNA Savi
unguiculata (L.) Walp.
XERODERRIS Roberty
Stuhlmannii (Taub.) Medonca & E.C.Sousa
XYLIA Benth.
torreana Brenan

Flacourtiaceae

DOVYALIS E. Mey. Ex Am.
hispidula Wild

Kirkiaceae

KIRKIA Oliv.
acuminata Oliv.

Lamiaceae

CLERODENDRUM L.
capitatum (Will.) Schumach. & Thonn.
glabrum E. Mey.
OCIMUM L.
americanum L.
PLECTRANTHUS L'Her.
tetensis (Baker) Agnew
VITEX L.
mombassae Vatke

Lauraceae

CASSYTHA L.
filiformis L. *

Maesaceae

? MAESA Forssk.
 lanceolata Forssk.

Malvaceae

ABUTILON Mill.
 sp.
HIBISCUS L.
 cannabinus L.
 surattensis L.
SIDA L.
 sp.

Meliaceae

EKEBERGIA Sparrm.
 capensis Sparrm.
TRICHILIA P.Browne
 dregeana Sond.

Menispermaceae

COCCULUS DC.
 hirsutus (L.) Diels

Moraceae

FICUS L.
 bussei Mildbr. & Burret
 capreifolia Delile
 glumosa Delile
 lutea Vahl
 sycamorus L.
MACLURA Nutt.
 africana (Bureau) Corner

Myrsinaceae

MYRSINE L.
 africana L.

Myrtaceae

SYZYGIUM Gaertn.
guineense (Willd.) DC.

Nymphaeaceae

NYMPHAEA L.
nouchali Burm. f. var. caerulea

Ochnaceae

OCHNA L.
sp. cf natalitia (Meisn.) Walp.

Olacaceae

OLAX L.
dissitiflora Oliv.
XIMENIA L.
americana L.

Oleaceae

JASMINUM L.
sp. cf angulare Vahl

Onagraceae

LUDWIGIA L.
adscendens (L.) Hara ssp diffusa (Forssk) P.H. Raven
sp. cf octovalvis (Jacq.) Raven

Orobanchaceae

BUCHNERA L.
sp.
CYCNIUM E. Mey. Ex Benth. amended Engl.
tubulosum (L.f.) Engl. ssp. tubulosum

Pedaliaceae

DICEROCARYUM Bojer
eriocarpum (Decne.) Abels

Plumbaginaceae

PLUMBAGO L.

zeylanica L.

Polygonaceae

PERSICARIA (L.) Mill.
decipiens (R.Br.) Wilson

Rhamnaceae

COLUBRINA Rich. ex Brongn
asiatica Rich. ex Brongn.
ZIZYPHUS Mill.
mauritiana Lam. *
mucronata Willd.

Rhizophoraceae

BRUGUIERA Lam.
gymnorrhiza (L.) Lam.
CASSIPOUREA Aubl.
gummiflua Tul. var verticillata (N.E. Br.) J Lewis
mossambicensis (Brehmer) Alston
CERIOPS Am.
tagal (Perr.) C.B. Rob.
RHIZOPHORA L.
mucronata Lam.

Rubiaceae

AGATHISANTHEMUM Klotzsch
bojeri Klotzsch
CANTHIUM Lam.
setiflorum Hiern
spinosum (Klotzsch) Kuntze
CATUNAREGAM Wolf
obovata (Hochst.) Conq
? COFFEA L.
racemosa Lour.
CROSSOPTERYX Fenzl
febrifuga (Afzel. Ex G.Don) Benth.
GARDENIA J. Ellis
resiniflua Hiern
ternifolia K.Schumach. & Thonn.
volkensii K.Schum.
?KRAUSSIA Harv.
floribunda Harv.

OLDENLANDIA L.
 sp.
OXYANTHUS DC.
 sp. cf speciosus DC
PAEDERIA L.
 bojeriana (A.Rich.) Drake ssp foetens (Hiern) Verdc.
PAVETTA L.
 sp. cf catophylla K.Schumach.
SPERMACOCE L.
 sp.
TRICALYSIA A.Rich. ex DC.
 sp. cf delagoensis Schinz
 sp. cf junodii (Schinz) Brenan
VANGUERIA Comm. ex Juss.
 infausta Burch.

Rutaceae

VEPRIS Comm. ex A.Juss.
 reflexa I.Verdc.

Salvadoraceae

AZIMA Lam.
 tetracantha Lam.
SALVADORA Garcin ex L.
 persica L.

Sapindaceae

ALLOPHYLLUS L.
 africanus P. Beauv. var africana
DEINBOLLIA Schumach. & Thonn.
 oblongifolia (E. Mey. Ex Am.) Radlk.
HIPPOBROMUS Eckl. & Zeyh.
 pauciflorus (L.f.) Radlk.
PAPPEA Eckl. & Zeyh.
 capensis Eckl. & Zeyh.

Sapotaceae

MANILKARA Adans.
 discolor (Sond.) J.H.Hemsl.
 mochisa (Baker) Dubard
MIMUSOPS L.
 zeyheri Sond.

SIDEROXYLON L.
 inerme L.

Solanaceae

SOLANUM L.
 panduraeforme E.Mey.

Sterculiaceae

STERCULIA L.
 africana (Lour.) Fiori
WALTHERIA L.
 indica L.

Strychnaceae

STRYCHNOS L.
 cocculoides Baker
 madagascariensis Poir.
 potatorum L.f.
 spinosa L. ssp spinosa

Tiliaceae

CORCHORUS L.
 asplenifolius Burch.
GREWIA L.
 bicolor Juss.
 flavescens Juss. var. flavescens
 inaequilatera Garcke
 lepidopetala Garcke
 monticola Sond.
 sulcata Mast.
 sp.

Verbenaceae

LANTANA L.
 camara L. *
LIPPIA L.
 javanica (Burm. f.) Spreng.

Violaceae

HYBANTHUS Jacq.

enneaspermus (L.) F. Muell. *

Vitaceae

CISSUS L.
cornifolia (Baker) Planch.
quadrangularis L. var quadrangularis
rotundifolia (Forssk.) Vahl
CYPHOSTEMMA (Planch.) Alston
sp. cf congestum (Baker) Desc. ex Wild & R.B.Drumm.
RHOICISSUS Planch.
revoilii Planch.

TABLE 4. A PRELIMINARY CHECKLIST OF THE MAMMALS OF COUTADA 5, SOFALA PROVINCE, MOZAMBIQUE

ORDER INSECTIVORA
Family **Macroscelididae**

PETRODROMUS Peters
tetradactylus Peters. Four-toed elephant shrew.

NYCTERIS Cuvier & Geoffroy
thebaica E. Geoffroy Egyptian Slit-faced Bat

ORDER PRIMATES
Family **Galagidae**

GALAGO E. Geoffroy
crassicaudatus E. Geoffroy Thicktailed Bushbaby .
senegalensis E. Geoffroy. Nightape.

Family **Cercopithecidae**

PAPIO Erxleben
ursinus Kerr. Chacma baboon.
CERCOPITHECUS L.
pygerythrus (F. Cuvier) Vervet monkey .

Family **Viverridae**

VIVERRA Linnaeus
civetta Schreber. Civet
GENETTA Oken
tigrina (Schreber) Largespotted genet .

ICHNEUMIA I. Geoffroy
albicauda (G. Cuvier) White-tailed Mongoose

ORDER TUBULIDENTATA
Family **Orycteropodidae**

ORYCTEROPUS G. Cuvier
afer (Pallas) Aardvark

ORDER ARTIODACTYLA
Family **Suidae**

POTAMOCHOERUS Gray
porcus (Linnaeus). Bushpig
PHACOCHOERUS F. Cuvier
africanus (Gmelin) Warthog

Family **Hippopotamidae**

Hippopotamus amphibious

Family **Bovidae**

NEOTRAGUS H. Smith
moschatus Von Dueben). Suni .
SYLVICAPRA Ogilby
grimmia Linnaeus. Grey duiker.
OUREBIA Laurillard
ourebi (Zimmermann) Oribi
RAPHICERUS H. Smith
campestris (Thunberg) Steenbok .
sharpei Thomas Sharpe's Grysbok
TRAGELAPHUS Blainville
scriptus (Pallas). Bushbuck.
strepsiceros (Pallas) Kudu
angasii Gray. Nyala.
AEPYCEROS Sundevall
melampus (Lichtenstein) Impala

ORDER LAGOMORPHA
Family **Leporidae**

LEPUS Linnaeus
capensis Linnaeus Cape Hare
saxatilis F. Cuvier. Scrub hare.

ORDER RODENTIA
Family **Hystricidae**

HYSTRIX Linnaeus
africaeaustralis Peters Porcupine

Family **Muscardinidae**

GRAPHIURUS Smuts
murinus(Desmarest) Woodland Dormouse

Family **Sciuridae**

PARAXERUS Forsyth Major
cepapi (A. Smith) Bush squirrel.
palliatus (Peters) Red squirrel

Family **Thryonomyidae**

THRYONOMYS Fitzinger
swinderianus (Temminck) Greater cane rat.

Family **Muridae**

ACOMYS I Geoffroy
spinosissimus (Peters) Spiny Mouse
MASTOMYS
natalensis (A. Smith). Multimammate Mouse.
CRICETOMYS Waterhouse
gambianus Waterhouse. Giant Rat.
TATERA Lataste
leucogaster (Peters). Bushveld Gerbil.

TABLE 5. A PRELIMINARY LIST OF BIRDS RECORDED FROM COUTADA 5, SOFALA DISTRICT, MOZAMBIQUE.	
SPECIES	COMMON NAME
Scopus umbretta	Hamerkop
Halieaetus vocifer	Fish Eagle
Terathopius ecaudatus	Bateleur
Micronisus gabar	Gabar Goshawk
Melierax metabates	Dark Chanting Goshawk
Polyboroides typus	Gymnogene

Numida meleagris	Helmeted Guineafowl
Guttera pucherani	Crested Guineafowl
Dendroperdix sephaena	Crested Francolin
Pternistis swainsonii	Swainson's Spurfowl
Turnix sylvatica	Kurrichane Button Quail
Vanellus coronatus	Crowned Plover
Streptopelia semitorquata	Red-eyed Dove
Streptopelia capicola	Cape Turle Dove
Turtur chalcospilos	Green-spotted Dove
Oena capensis	Namaqua Dove
Treron calva	African Green Pigeon
Poicephalus cryptoxanthus	Brown-headed Parrot
Corythaixoides concolor	Grey Turaco
Tauraco porphyreocephalus	Purple-crested Turaco
Bubo africanus	Spotted Eagle Owl
Colius indicus	Red-faced Mousebird
Halcyon chelicuti	Striped Kingfisher
Coracias caudata	Lilac-breasted Roller
Coracias spatulata	Raquet-tailed Roller
Bycanistes bucinator	Trumpeter Hornbill
Tockus nasutus	Grey Hornbill
Tockus flavirostris	Yellow-billed Hornbill
Upupa epops	Hoopoe
Phoeniculus purpureus	Red-billed Hoepoe
Rhinopomastus cyanomelas	Scimitar-billed Hoepoe
Indicator indicator	Greater Honeyguide
Lybius torquatus	Black-collared Barbet
Dendropicos fuscescens	Cardinal Woodpecker
Dicrurus adsimilis	Fork-tailed Drongo
Oriolus larvatus	Black-headed Oriole
Turdoides jardineii	Arrow-marked Babbler
Pyhyllastrephus terrestris	Terrestrial Bulbul
Pycnonotus barbatus	Black-eyed Bulbul
Sylvietta rufescens	Long-billed Crombec
Muscicapa adusta	Dusky Flycatcher
Melaenornis pammelaina	Black Flycatcher
Batis soror	Mozambique Batis
Camaroptera brachyura	Green-backed Bleating Warbler
Lamprotornis chalybaeus	Greater Blue-eared Starling
Laniarius aethiopicus	Tropical Boubou
Tshagra senegala	Black-crowned Tchagra
Prionops plumatus	White-helmet Shrike
Ploceus intermedius	Lesser Masked Weaver
Anaplectes rubriceps	Red-headed Weaver
Euplectes afer	Golden Bishop
Emberiza tahapisi	Rock Bunting

TABLE 6. LIST OF REPTILES AND AMPHIBIANS OCCURRING OR LIKELY TO OCCUR IN COUTADA 5, SOFALA DISTRICT, MOZAMBIQUE.			
SPECIES	Common Name	Rec	End.
Tortoises, Terapins, Turtles			
Kinixys b. belliana	Bell's Hinged Tortoise		
Pelusios castanoides	Yellow-bellied Hinged Terrapin		
Pelusios sinuatus	Serrated Hinged Terrapin		
Pelusios subniger	Pan Hinged Terrapin		
Cycloderma frenatum	Zambezi Soft-shelled Terrapin		
Caretta caretta	Loggerhead Turtle		
Eretmochelys imbricata	Hawksbill Turtle		
Lepidochelys olivacea	Olive Ridley Turtle		
Dermochelys coriacea	Leatherback Turtle		
Chelonia mydas	Green Turtle		
Lizards			
Hemidactylus mabouia	Tropical House Gecko		
Hemidactylus platycephalus	Flat-headed House Gecko	x	
Lygodactylus capensis	Cape Dwarf Gecko	x	
Agama armata	Peter's Ground Agama	x	
Agama mossambica	Mozambique Agama		x
Chamaeleo dilepis	Common Chameleon	x	
Trachylepis depressa	Eastern Coastal Skink		
Trachylepis punctulata	Bushveld Variegated Skink	x	
Trachylepis varia	Variable Skink	x	
Trachylepis striata	Striped Skink		
Lygosoma afrum	Mozambique Writhing Skink		x
Lygosoma sundevallii	Sundevall's Writhing Skink		
Panaspis wahlbergii	Wahlberg's Snake-eyed Skink		
Typhlosaurus aurantiacus	Golden Blind Legless Skink		
Ichnotropis capensis	Cape Rough-scaled Lizard		
Ichnotropis squamulosa	Peter's Rough-scaled Lizard		
Nucras caesicaudata	Blue-tailed Sandveld Lizard		
Gerrhosaurus major major	Rough-scaled Plated Lizard		
Gerrhosaurus flavigularis	Yellow-throated Plated Lizard		
Cordylus tropidosternum	Tropical Girdled Lizard		
Varanus albigularis	Veld Monitor		
Varanus n. niloticus	Water Monitor	x	
Amphisbaenians			
Monopeltis s. sphenorhynchus	Slender Spade-snouted Worm		

	Lizard		
Zygaspis violacea	Violet Round-headed Worm		
	Lizard		
Snakes			
Rhinotyphlops mucruso	Giant Beaked Blind Snake		
Leptotyphlops scutifrons	Peters' Thread Snake		
Python natalensis	Southern African Python	x	
Xenocalamus bicolor lineatus	Bicoloured Quill-snouted Snake		
Amblyodipsas p. polylepis	Common Purple-glossed Snake		
Atractaspis bibronii	Bibron's Burrowing Asp		
Aspidelaps scutatus fulafula	Shield-nosed Snake		
Elapsoidea boulengeri	Boulenger's Garter Snake		
Naja melanoleuca	Forest Cobra		
Naja annulifera	Snouted Cobra		
Naja mossambica	Mozambique Spitting Cobra		
Dendroaspis polylepis	Black Mamba		
Pelamis platurus	Yellow-bellied Sea Snake		
Bitis arietans	Puff Adder		
Boaedon capensis	Brown House Snake		
Lamprophis obscuriventris	Floodplain Water Snake		
Gonionotophis capensis	Cape File Snake		
Hemirhagerrhis nototaenia	Eastern Bark Snake		
Rhamphiophis rostratus	Rufous Beaked Snake		
Psammophis angolensis	Dwarf Sand Snake		
Psammophis orientalis	Mozambique Stripe-bellied		
	Sand Snake		
Psammophis mossambicus	Olive Grass Snake		
Meizodon semiornatus	Semiornate Snake		
Prosymna stuhlmanii	East African Shovel-snout		
Philothamnus hoplogaster	Green Water Snake		
Philothamnus n. natalensis	Natal Green Snake		
Philothamnus semivariegatus	Spotted Bush Snake		
Crotaphopeltis hotamboeia	Herald Snake		
Telescopus semiannulatus	Eastern Tiger Snake		
Dipsadoboa aulicus	Marbled Tree Snake		
Dispholidus typus	Boomslang		
Thelotornis capensis oatesii	Vine Snake		
Dasypeltis scabra	Common Egg-eater		
Crocodile			
Crocodylus niloticus	Nile Crocodile	x	
Amphibia			
Arthroleptis stenodactylus	Shovel-footed Squeaker		
Breviceps adspersus	Bushveld Rain Frog		

Breviceps mossambicus	Mozambique Rain Frog		
Xenopus muelleri	Tropical Platanna		
Amietophrynus garmani	Olive Toad		
Amietophrynus gutturalis	Gutteral Toad		
Amietophrynus maculatus	Flat-backed Toad		
Hemisus marmoratus	Mottled Shovel-nosed Frog		
Phrynomantis b. bifasciatus	Banded Rubber Frog		
Amietia angolensis	Common River Frog	x	
Tomopterna krugerensis	Knocking Sand Frog		
Ptychadena anchietae	Plain Grass Frog		
Ptychadena mascareniensis	Mascarene Grass Frog		
Ptychadena oxyrhynchus	Sharp-nosed Grass Frog		
Ptychadena mossambica	Broad-banded Grass Frog		
Phrynobatrachus mababiensis	Dwarf Puddle Frog		
Phrynobatrachus acridoides	East African Puddle Frog		
Phrynobatrachus natalensis	Snoring Puddle Frog		
Pyxicephalus edulis	African Bullfrog		
Chiromantis xerampelina	Southern Foam Nest Frog		
Leptopelis mossambica	Brown-backed Tree Frog		
Leptopelis natalensis	Forest Tree Frog		
Hildebrandtia ornata	Ornate Frog		
Kassina maculata	Red-legged Kassina		
Kassina senegalensis	Bubbling Kassina		
Afrixalus fornasinii	Greater Leaf-folding Frog		
Afrixalus delicatus	Delicate Leaf-folding Frog		
Hyperolius argus	Argus Reed Frog		
Hyperolius pusillus	Water Lily Frog		
Hyperolius tuberilinguis	Tinker Reed Frog		
Hyperolius m. marmoratus	Painted Reed Frog		
Hyperolius marmoratus taeniatus	Painted Reed Frog		
REC. = recorded; END = endemic to Mozambique.			

TABLE 7. LIST OF BUTTERFLIES RECORDED IN COUTADA 5 SOFALA PROVINCE, MOZAMBIQUE.	
SPECIES	COMMON NAME
Hamanumida daedalus	Guineafowl
Biblia ilithyia	Spotted Joker
Danaus chrysippus	African Monarch
Junonia hierta cebrene	Yellow Pansy
Vanessa cardui	Painted Lady
Eurema brigitta	Broad-bordered Grass Yellow
Colotis ione	Common Purple Tip
Mylothris agathina agathina	Common Dotted Border
Acraea caldarena caldarena	Black-tipped Acraea

Euchrysops malathana	Common Smoky Blue