

Guidelines for Forest Management Planning

June 2007

Forestry Development Authority

Guidelines for Forest Management Planning

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GLOSSARY

| | |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Biological diversity: | The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems. (see Convention on Biological Diversity, 1992) |
| Block | 100 ha harvesting area, forming part of annual coupe |
| Buffer strip | Strip of vegetation left intact along a watercourse or other sensitive area |
| Chain of custody | The channel through which products are distributed from their origin in the forest to their end-use |
| Chemicals | The range of fertilizers, insecticides, fungicides, and hormones which are used in forest management |
| Coupe | A defined area of forest of variable size, on which harvesting takes place usually over one year |
| Criterion (pl. Criteria) | A means of judging whether or not a Principle (of forest stewardship) has been fulfilled. |
| Customary rights: | Rights which result from a long series of habitual or customary actions, constantly repeated, which have, by such repetition and by uninterrupted acquiescence, acquired the force of a law within a geographical or sociological unit. |
| Cutting (or felling) cycle | The number of years between successive harvests on an area of forest |
| Directional felling | Predetermining on a predefined set of criteria the preferred direction of fall of a tree. |
| Ecosystem | A community of all plants and animals and their physical environment, functioning together as an interdependent unit. |
| Endangered species | Any species which is in danger of extinction throughout all or a significant portion of its range. |
| Forest compartment | Area of 5-year forest management plan comprised of 5 annual coupes |
| Forest integrity | The composition, dynamics, functions and structural attributes of a natural forest |
| Forest management/manager | The people responsible for the operational management of the forest resource and of the enterprise, as well as the management system and structure, and the planning and field operations. |
| Forest management unit (FMU) | a clearly defined forest area with mapped boundaries, managed by a single managerial body to a set of explicit objectives which are expressed in a self-contained multi-year management plan. |
| Forest stewardship | Forest management which, in conformity with the FSC Principles and Criteria for Forest Stewardship, is environmentally responsible, socially beneficial, and economically viable. |
| Indicator | A quantitative or qualitative variable which can be measured or described, and which provides a means of judging whether a forest management unit complies with the requirements of an FSC Criterion. Indicators and the associated thresholds thereby define the requirements for responsible forest management at the level of the forest management unit and are the primary basis of forest evaluation. |
| Indigenous lands and territories | The total environment of the lands, air, water, sea, sea-ice, flora and fauna, and other resources which indigenous peoples have traditionally owned or otherwise occupied or used. (Draft Declaration of the Rights of Indigenous Peoples: Part VI) |

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| High Conservation Value Forests | Forests that possess one or more of the following attributes: a) Forest areas containing globally, regionally or nationally significant : concentrations of biodiversity values (e.g. endemism, endangered species, refugia); and/or large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance b) Forest areas that are in or contain rare, threatened or endangered ecosystems c) Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control) d) Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health) and/or critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities). |
| Log landing (or log market) | A cleared area where logs are assembled after being skidded, awaiting subsequent handling, loading and transport. |
| Non-timber forest products | All forest products except timber, including other materials obtained from trees such as resins and leaves, as well as any other plant and animal products. |
| Principle | An essential rule or element; in FSC's case, of forest stewardship. |
| Sediment | Fragments of rock, soil, and organic material transported and deposited in bed by water, wind or other natural phenomena |
| Silviculture | The art of producing and tending a forest by manipulating its establishment, composition and growth to best fulfill the objectives of the owner. This may, or may not, include timber production. |
| Skid trail | Trail along which a log is dragged by a extraction machine to the log landing |
| SLIMF (small or low intensity managed forest): | A forest management unit that meets specific FSC requirements related to size and/or intensity of timber harvesting, and can therefore be evaluated by certification bodies using streamlined evaluation procedures. |
| Tenure | Socially defined agreements held by individuals or groups, recognized by legal statutes or customary practice, regarding the "bundle of rights and duties" of ownership, holding, access and/or usage of a particular land unit or the associated resources there within (such as individual trees, plant species, water, minerals, etc). |
| Threatened species | Any species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range |
| Use rights | Rights for the use of forest resources that can be defined by local custom, mutual agreements, or prescribed by other entities holding access rights. These rights may restrict the use of particular resources to specific levels of consumption or particular harvesting techniques |

ABBREVIATIONS & EQUIVALENTS

| | |
|-------|----------------------------------|
| AOP | Annual Operational Plan |
| FDA | Forestry Development Authority |
| FMC | Forest Management Contracts |
| HP | Harvest Plan |
| 5YFMP | 5-Yr Forest Management Plan |
| SFMP | Strategic Forest Management Plan |
| TSC | Timber Sales Contracts |
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TABLE OF CONTENTS

| | |
|-------------------------------------------------------------------------------|-------------------------------------|
| GLOSSARY | i |
| ABBREVIATIONS & EQUIVALENTS | iii |
| I. Introduction | 1 |
| 1.1 Best practice forest management planning | 1 |
| 1.2 Objectives | 1 |
| 1.3 Development of the Guidelines | 2 |
| II. PLANNING REQUIREMENTS..... | 3 |
| 2.1 Introduction..... | 3 |
| 2.2 Strategic Forest Management Plan and Environmental Impact Assessment..... | 5 |
| 2.3 Five-Year Forest Management Plan | 6 |
| 2.4 Annual Operational Plans | 6 |
| 2.5 Harvest Plan (TSC)..... | 7 |
| III. STRATEGIC FOREST MANAGEMENT PLAN AND EIA..... | 8 |
| 3.1 Introduction to the Plan..... | 8 |
| 3.2 Objectives | 9 |
| 3.3 Forest ecology and forest management strategies | 9 |
| 3.4 Social impact assessment..... | 10 |
| 3.5 Forest management and business plan..... | 11 |
| 3.6 Environmental impact assessment | Error! Bookmark not defined. |
| 3.7 Infrastructure development | 11 |
| 3.8 Other contractual issues | 11 |
| IV. 5-YEAR FOREST MANAGEMENT PLAN..... | 15 |
| 4.1 Introduction to the Plan..... | 15 |
| 4.2 Objectives | 16 |
| 4.3 Forest management prescriptions | 16 |
| 4.4 Social impact assessment..... | 17 |
| 4.5 Environmental impact assessment | 17 |
| 4.6 Other issues..... | 17 |
| V. ANNUAL OPERATIONAL PLAN | 20 |
| 5.1 Introduction to the Plan..... | 20 |
| 5.2 Objectives | 21 |
| 5.3 Review of activities during previous year | 21 |
| 5.4 Forest Inventory activities projected to be undertaken | 22 |
| 5.5 Infrastructure projected to be undertaken | 22 |
| 5.6 Logging operations in upcoming year | 23 |
| 5.7 Other operational plans in upcoming year | 23 |
| 5.8 Other contractual issues | 24 |
| VI. HARVEST PLAN (TSC) | 28 |
| 6.1 Introduction to the Plan..... | 28 |
| 6.2 Objectives | 29 |
| 6.3 Review of activities during previous year | 29 |
| 6.4 Forest Inventory activities projected to be undertaken | 30 |
| 6.5 Infrastructure projected to be undertaken | 30 |
| 6.6 Logging operations in upcoming year | 30 |

| | |
|----------------------------------------------------------------|----|
| 6.7 Other operational plans in upcoming year | 31 |
| 6.8 Other contractual issues | 31 |
| Appendix 1: Principles and Criteria & Generic Indicators | 36 |

TABLES

| | |
|----------------------------------------------------------------------|----|
| Table 1: Summary chart for Strategic Forest Management Plan | 13 |
| Table 2: Summary chart for 5-Year Forest Management Plan | 18 |
| Table 3: Summary chart for Annual Operational Plan | 25 |
| Table 4: Summary chart for TSC Harvest Plan | 33 |
| Appendix Table 1: Principles and Criteria & Generic Indicators | 1 |

FIGURES

| | |
|--------------------------------------------|---|
| Figure 1: Forest management planning | 5 |
|--------------------------------------------|---|

I. INTRODUCTION

1.1 Best practice forest management planning

The Forestry Development Authority (FDA) has prepared the “Guidelines for Forest Management Planning” to provide a clear set of instructions to help foresters and logging companies prepare the forest management plans and operational plans required under the Forest Management Contracts (FMC), Timber Sales Contracts (TSC), or other FDA commercial contracts, including commercial logging in community forests.

The purpose of these guidelines is to outline the plans for forest management and environmental impact assessment, to which the FDA requires all contract holders to adhere, and upon which the approval of management plans will be made.

The planning requirements for harvesting forests, whether under FMC, TSC and other commercial harvesting permits, differ in both the types of plans to be submitted and also the level of detail. Notwithstanding these differences, however, the *Guidelines* should ensure that all logging companies conduct harvest activities in a way that meet standards for sustainable forest management.

The aim of the new national forestry policy is: “*To conserve and sustainably manage all forest areas, so that they will continue to produce a complete range of goods and services for the benefit of all Liberians and contribute to poverty alleviation in the nation.*” This goal is reflected throughout the revised forest legislation (amended forest law and FDA regulations), the Code of Forest Harvesting Practices and these forest management guidelines.

1.2 Objectives

The *Guidelines for Forest Management Planning* have been developed to help the forest managers and staff of companies allocated FMC, TSC and other commercial permits, as well as FDA and staff in other government agencies, to prepare and approval respectively forest management and timber harvesting plans.

The objectives of the *Guidelines for Forest Management Planning* are to:

- Provide forest operators with a set of guidelines and standards for improved forest harvesting practices that improve standards of logging and reduce environmental impacts, and so contribute to the conservation of all forests through their wise use.
- Promote the health and safety of forest workers and the public.

- Provide a framework for effective control of timber harvesting operations with predetermined guidelines and benchmarks.

1.3 Development of the Guidelines

The *Guidelines* have been prepared based upon: (a) the lessons learned in the country about forest management over the past 15 years; (b) practices and standards that have been developed from experience in tropical forests, particularly in West and Central Africa; (c) the new policy reforms and legislative reforms, including the requirements of the Environmental Protection law, and (d) the work on forest certification by the ITTO, ATO, and certification bodies.

This is the first set of guidelines for forest management planning prepared in the country. The *Guidelines* should be read together with FDA's "*Code of Forest Harvesting Practices*". Both the *Guidelines* and the *Code* will be reviewed on a regular basis by the FDA through consultations with the forest industry, government agencies such as the EPA, civil society organizations, community groups and other interested parties, including independent certification bodies of forestry practices

Forest management in Liberia

In the past forest management plans become at best synonymous with unfulfilled good intentions; while at worst they sanctioned damaging forest harvesting. In many instances management plans and concession agreements were copied irrespective of the type of forest or its management needs as shown by the Forest Concession Review.

The **future** of Forest Management in Liberia, as required in the Forest Reform Law, is to ensure that forests are managed in a sustainable manner (regulated by several parameters (mortality, growth, regeneration) while also integrating important biodiversity and social issues into the management. The management of Liberia's forest will take into account wildlife issues such as hunting, and the creation of plant and animal refuges. They also include agreements with authorities and local populations in terms of local development (roads, health infrastructure, and redistribution of the timber income).

II. PLANNING REQUIREMENTS

2.1 Introduction

Forest management plans, including operational harvesting plans, describe the manner in which commercial logging will be carried out. The plans specify:

- The optimum harvest production rates according to yield regulations.
- The means to minimize environmental and other impacts as well as harvesting and transport costs associated with harvesting operations (e.g. forest road layout and associated infrastructure, logging methods, post-harvest activities).
- The means to minimize harvesting and transport costs, subject to the constraints imposed by environmental, ecological and social considerations.
- The processes and measures to be taken to accommodate the needs and wishes of local communities and for their participation in the planning and monitoring harvesting operations, as well as other agreements concerning forest use rights and responsibilities, benefit sharing arrangements, the use of local labour, the collection of non-timber forest products, compensation for crop damage, etc.
- The measures to ensure the health and safety of workers and the public.

Planning of timber harvests is one part of overall forest management planning, which is itself a component of comprehensive land-use planning. The FDA is mandated to carry out broad scale land use planning of forests in conjunction with other government agencies and in accordance with national land use policy. The FDA has adopted as a guiding principle of the national forestry policy the “3C” concept: balancing conservation, community and commercial forestry needs. The FDA’s land use suitability mapping identifies the permanent forest estate and the areas within the estate to be allocated to commercial forestry, community forestry and conservation (protected areas). This guides the FDA in the formulation of the National Forestry Strategy Plan, (see fig.1). This planning process is carried out through process of public participation at the national, regional and local levels.

Within the commercial areas of the permanent forest estate the FDA allocates forest management contracts (FMC) according to size categories. Commercial timber harvesting is also permitted through timber sales contracts (TSC) in areas of mixed agriculture and forest lands. In these areas timber harvesting is inherently unsustainable, nonetheless planning is required in order to address social objectives and reduce the environmental impacts of logging.

The allocation of all public forests designated for commercial logging depends upon the outcome of competitive bidding for timber rights (forest management contracts and timber sales contracts) as laid down by the Public Procurement and Concessions Law (2005). The law requires that local stakeholder consultation occur after potential areas for commercial logging have been identified and before the bidding process begins. All

Guidelines for Forest Management Planning

affected stakeholders are consulted as to whether they shall give their consent and shall be prepared to sign an undertaking to negotiate in good faith a social agreement with the eventual winner of a bid of a forest management contract.

Private companies awarded **forest management contracts** are obliged to prepare 3 types of management plan:

- A strategic or comprehensive forest management plan and environmental impact assessment for the entire contract area
- A plan for operations to be carried out in a 5-year period
- An annual operational plan

Private companies awarded **timber sales contracts** are obliged to prepare:

- A harvest plan (similar to the annual operational plan), which describes the proposed operational plans.
- A brief environmental review and Finding of No Significant Impact approved by EPA.

Harvest planning whether in a natural forest or a conversion forest is not by itself forest planning: the harvest plan is only one part of a process of more comprehensive forest management plan. The two steps are complementary, and essential in order to enable sustainable harvesting practices to be followed, and also to reconcile the need for greater technical control during harvesting with the need to reduce harvesting costs. Logging operators may believe that more stringent forest management or harvesting planning and environmental protection will raise their costs. But this is not the case: improved planning improves operators' control over logging and will reduce their overall costs.

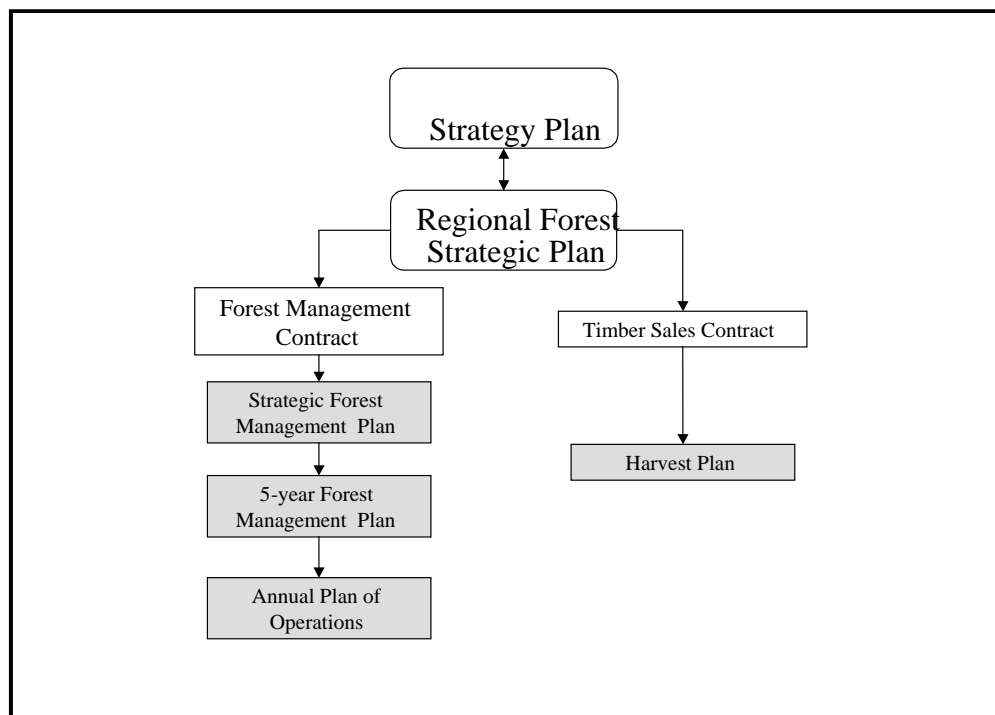


Figure 1: Forest management planning

2.2 Strategic Forest Management Plan and Environmental Impact Assessment

The comprehensive or strategic forest management plan is a working document that states (a) the objectives for a forest management unit, (b) describes and analyses the financial, technical, biological, social and environmental constraints to management, and (c) provides the simplest possible guidelines as to how the objectives will be achieved and describes how those achievements will be measured. The management plan is a long-term plan prepared for the forest contract holder and for the FDA – the regulatory agency. As a planning tool it provides management activities with targets indicators that measure performance. In order to do this it is necessary to describe the resource as it stands at the present, the past events that have shaped it and the biophysical and social factors that affect it presently and may affect it or associated management activities in the future.

The purpose of the strategic forest management plan is to describe the specific considerations and constraints that will determine the operational targets and the management guidelines. This information will be drawn from various sources (public and legal records, soil maps, market prices) and may include the field data collected specifically for the purposes of management planning. Reliable data is often expensive, therefore only that which is truly necessary should be collected. However, unreliable data has high opportunity costs too, forcing the responsible forest manager to limit operational targets to more conservative estimates that are known not to affect the long-term integrity of the resource. If important information is not available or if the quality of the source data is unreliable then this should be highlighted in the strategic forest management plan along with any subsequent assumptions that are made.

Forest management objectives

Defining objectives for management is not the same as including objectives in a management plan. To *define objectives* implies a realistic appraisal of all management options; and subsequently their prioritisation. It should be undertaken by the forest manager in consultation with the FDA, in the context of the biophysical condition of the resource and within the prevailing forestry legislative framework. Management objectives should be fixed. Although the management plan is a working document this does not imply that shall be flexibility in the definition of objectives in order to respond to changing circumstances and new information. This is to confuse management objectives with operational targets. Objectives give purpose and stability on the management process, both of which are qualitative functions, i.e. they cannot be directly measured. Operational targets are quantifiable and can be easily adjusted, in the light of

Guidelines for Forest Management Planning

new information, without affecting the overall purpose or stability of the management plan.

An environmental impact assessment is also to be conducted on the basis of the forest management plan. The environmental impact assessment must include a description of the measures that will be taken to mitigate the effects of the logging activities; with specific attention to the mitigating activities or design that will be implemented during the construction of forest roads, the measures to protect watercourses, measures to ensure reduced impact logging, the management of timber processing, the post-harvest closure of forest roads and other logging control measures.

Environmental impact assessment

The successful integration of EIA into the management of Liberia's forestland has the potential to improve the management of Liberia's natural resources. The EIA requirement to disclose and evaluate environmental effects provides a mechanism in which decisions regarding specific land uses and their effects can be determined and understood in a transparent process.

2.3 Five-Year Forest Management Plan

The 5-Year Forest Management Plan (5YFMP) is prescriptive or tactical. It follows directly from the SFMP. It should be kept as concise as possible and relevant to the objectives of management. Hence, it defines the schedules of work and the operational targets for the specific forest compartment level, which in turn serves as the basis for the preparation of the five annual operational plans for that forest compartment.

It prescribes the silvicultural system to be employed. It prescribes the specifications for the road network and other infrastructure and the construction and extraction equipment. The guidelines and time scale for the preparation of annual operational plans for the forest compartment and the post-harvest treatment of the forest stand should also be outlined. The plan shall include prescriptions for both immediate (harvesting) and long-term (fire control, hunting, illegal logging) monitoring and control measures. A brief description of data management and reporting procedures that will be employed both during the harvest and over the duration of the felling cycle is also required.

2.4 Annual Operational Plans

The Annual Operational Plan (AOP) is prepared from the 5YFMP. It describes the main activities to be undertaken in the upcoming operational year including logging and other activities, and also provides a review of the previous operational year's activities. The Plan is based upon the preparation of harvesting block maps and an analysis of the

Guidelines for Forest Management Planning

potential yield, which is determined by the commercial stock within each block and inventory data from the forest compartment.

The Plan details the road and other infrastructure construction and maintenance, and hence the operational activities to be undertaken. In the preparation of the AOP particular attention shall be paid to the *Code of Forest Harvesting Practices*. The Plan relates to the operational targets of the 5YFMP and the contract holder's business plan.

2.5 Harvest Plan (TSC)

The Harvest Plan (HP) for TSC is structured closely on the AOP described above. The main difference is that whereas the AOP is derived from the 5YFMP and SFMP, the HP is a freestanding document describing and prescribing operational activities in conversion forests. Although sustainable timber yields are not an objective, high standards of environmental control are required, as well as a demonstrable high level of social agreement with local communities and affected farmers. The Environmental Review requirements shall follow the outline included as Appendix 2. The information included in the Environmental Review should be brief to allow EPA to review to assist in the Finding of No Significant Impact Determination. (NEED TO ADD BOTH EA AND FONSI in Appendix 2)

In its prescriptions for logging and operational activities the HP like the AOP shall follow closely the *Code of Forest Harvesting Practices*.

III. STRATEGIC FOREST MANAGEMENT PLAN AND EIA.

3.1 Introduction to the Plan

The Strategic Forest Management Plan (SFMP) formulates the strategy of sustainable forest management in contract area. It describes the management objectives and qualitative indicators for the SFMP. It provides a description of the forest resources, the main environmental constraints, and based upon these factors the proposed silvicultural management approach. It should be a short and concise document (main text maximum 25 pages) with supporting topographic maps and appendices.

It provides a description of the contract holder's company, and its human, technical and financial resources. The Plan shall refer throughout to the contract holder's agreed business plan, not least with regard to relations with local communities, value-added processing and forest certification.

The Plan shall provide an indication of the expected yield from harvesting, and a description of the proposed techniques for harvesting, and the road construction and logging equipment to be used.

The Plan shall describe the proposed environmental safeguards that shall be undertaken, whether directly related to logging activities or to downstream impacts. It shall describe the plans for the protection of rare, threatened and endangered flora and fauna, the protected of cultural sites and other conservation areas of special interest or areas providing important environmental services. It shall describe the proposed systems for monitoring forest dynamics, socio-economic and environmental impacts.

Under the terms of the contracts the SFMP shall be revised every 5 years in conjunction with the independent forest management review. The revised Plan shall incorporate the results of additional resource inventories, other silvicultural information derived from forest growth and yield studies, plus feedback from monitoring programmes including information on environmental and social factors.

3.1.1 Table of Contents of SFMP

- Executive summary
- Document record sheet
- Objectives
- Forest type & stratification
- Social environment

Guidelines for Forest Management Planning

- Company, business plan
- Environmental impact assessment
- Infrastructure projected to be undertaken
- Other operational plans in initial 5-year period of operations
- Other contractual issues
- Attachments: maps, appendices

3.1.2 Executive Summary

The SFMP shall include a 2-page maximum summary written in both English, which should be translated into at least one local language commonly used by local community members.

3.1.3 Document Record Sheet

A 1-page sheet showing the following information:

- Name and contact address of Contract holder.
- Contract reference number.
- SFMP reference number
- Date of submission to FDA for approval
- Signatures

3.2 Objectives

The Plan shall *define the objectives* of forest management and provide qualitative indicators.

The objectives will depend upon the type and scale of forest resources, and upon the company of the contract holder, and shall therefore also reflect the business plan.

3.3 Forest ecology and forest management strategies

Describe the forest resources and ecology in the contract area (and as necessary neighboring or contiguous forests). If there are distinct forest strata then each shall be described. Describe the environmental constraints that affect forest management options both within the contract area and downstream. Any unique ecological systems shall be described together with the proposed measures to maintain or restore them.

The Plan shall provide a brief silvicultural history of the forest(s) within the contract area, including if available a description and analysis of previous management systems, data

Guidelines for Forest Management Planning

on harvest levels, species composition, etc. Where these have been carried out, the Plan should describe and analyze additional inventories (for both timber and NTFP).

Describe the proposed management prescriptions based upon the analysis of the silviculture and ecology of the forest(s). The Plan shall describe and analyze sustainable harvest levels based on empirical data and other information regarding estimates of growth and yield. From this the Plan shall describe the proposed scheduling of forest compartments, the harvesting regime and equipment to be used, and proposals for value-added processing as appropriate. Provide information and a schedule on the expected harvest rates by species.

The description should refer to the maps provided which shall show the forest types or strata, significant topographic features, main watercourses, and any existing and proposed primary and secondary road network and other forest infrastructure, proposed forest compartments and the schedule for harvesting each compartments (for which each a 5-year forest management plan shall be prepared in due course).

Additionally maps shall indicate location of settlements, areas of non-forest land use as appropriate, protected areas, including cultural and other sites of ecological, spiritual or economic significance. The Plan shall outline measures to be undertaken to safeguard these special sites as well as the habitats of rare or endangered species.

The Plan shall describe information gaps and a timetable indicating proposals to generate silvicultural and technical data on forest dynamics, regeneration as well as environmental and social impact assessments.

3.4 Environmental and Social impact assessment

The SFMP shall incorporate measures to mitigate the environmental and social impact of operations, and these should be reflected throughout the SFMP.

The EIA shall describe the past, present and expected future ecological and social resource conditions and indicate how these conditions will be affected by the proposed forest operations, at a level of the forest resource (i.e. within the contract area and downstream, for example watershed management). The EIA shall include a description of the potential effects (direct, indirect, and cumulative) and any mitigating activities on rare and endangered species and their habitats (i.e. CITES Appendix 1, and national lists of endangered species). The EIA shall also include a description of the predicted effects (direct, indirect, and cumulative) to the timber species.

The effects of protecting special areas (protection and conservation areas) shall also be described as well as the estimated effects of controlling the illegal hunting.

The EIA shall describe effects to land use, ownership and access rights (formal and customary) and affecting local communities, in particular their main livelihood activities.

Guidelines for Forest Management Planning

The contract holder shall undertake community consultations in the preparation of the Plan. The Plan shall briefly describe the approaches taken, and demonstrate that the results of these consultations and evaluations of social impact have been included in the proposed interventions. The Plan shall discuss the social agreement and the mechanism agreed upon with regard monitoring the codes of conduct, local employment and benefit sharing arrangements, and forest use rights (access for legal hunting, fishing, trapping and NTFP collecting).

Also the Plan shall outline proposed programmes for monitoring and assessment of Plan with communities and other affected parties.

3.5 Forest management and business plan

The propose forest management system shall be described in relation to the contract holder's business plan. It shall indicate the estimates of economic viability of the forest management,

The business plan shall include: (a) budgets for the estimated operational costs of production, forest management, road and other infrastructure construction and maintenance, silvicultural treatments, plus (b) the investment costs of environmental, conservation and social activities, and (c) the expected income flow for the duration of the plan.

3.7 Infrastructure development

The Plan shall describe the proposed schedule for infrastructure development for the forest compartments, and the installation of processing facilities in or adjacent to the contract area. Describe plans and programmes for waste disposal in general, and specifically for timber processing

3.8 Other contractual issues

The communities within, or adjacent to, the forest management area should be given opportunities for employment, training, and other services. Agreement with regard to provisions for living quarters and other facilities needed to accommodate forest workers

Training plan prepared. All employees' formal and informal training and supervision to ensure operational plans adhered to. general information on health and safety provisions.
Guidelines

Guidelines for Forest Management Planning

In this section the contract holder will describe plans for monitoring the contract area. This shall include monitoring for illegal activities (unauthorized pit-sawing, hunting, mining, etc) and monitoring with community and civil society groups. Proposed system to document and report illegal activities (hunting, mining, settlement, etc)

Schedule for reporting on progress in meeting forest certification goals and targets as appropriate

Guidelines for Forest Management Planning

Table 1: Summary chart for Strategic Forest Management Plan

| Activity | Output | Observations |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Strategic Forest Management Plan | Objectives. | The SFMP needs to be submitted at least 3 months before the first logging season commences, in order that FDA can approve plan. |
| <p>An initial a pre-harvest inventory of the forest stand(s) within the contract area is optional.</p> <p>The inventory included in the prospectus may be sufficient.</p> <p>Forest certification will probably require additional inventory and analysis during the first 5-year contract period.</p> <p>SFMP shall be updated accordingly.</p> | <p>The aim is to provide information on the structure and floristic composition of the stand(s) that will be used to determine the condition of areas for 5YFMP and timing harvesting.</p> <p>Stand tables for basal area, volume and # trees per hectare for each forest stand.</p> | Inventory methods shall be undertaken as per FDA regulations, or as agreed. |
| Topographic base map at a scale of 1:50,000 or ideally 1:25,000 showing: | <p>Existing infrastructure (roads, etc); settlements; relief; contract area boundaries; protected areas, and cultural sites.</p> <p>Contract area boundaries cleared (25m)</p> | <p>Digitized map (UTM) and hard copies submitted to FDA.</p> <p>The use of natural or artificial (e.g. rivers, roads) features to demarcate boundaries recommended, and concrete posts shall be installed at major turning points and at 1000m intervals.</p> |

Guidelines for Forest Management Planning

| | | |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| Topographic base map at a scale of 1:50,000 or ideally 1:25,000 showing | Forest types; watercourses; slopes, and other land uses. Division of contract area into 5-Yr management compartments | Digitized map (UTM) and hard copies submitted to FDA |
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IV. 5-YEAR FOREST MANAGEMENT PLAN

4.1 Introduction to the Plan

The 5-Year Forest Management Plan is a tactical plan. The Plan provides operational targets with quantitative indicators for the management objectives from the forest management strategy. It prescribes the work schedule for 5 years of operations within a forest compartment, which in turn is comprised of 5 annual operational areas, for each of which an annual operational plan will be prepared. The Plan details the structural and floristic composition of the forest resources, and shall provide estimates of the yield from harvesting, based upon pre-harvesting sample inventories. It identifies the main environmental constraints, and prescribes the proposed environmental safeguards that shall be undertaken, whether directly related to logging activities or to downstream impacts, and the measures to protect specific sites of special interest and other conservation areas.

The Plan shall refer throughout to the contract holder's agreed business plan, not least with regard to relations with local communities, harvesting and construction and extraction equipment, value-added processing and forest certification.

It should be a short and concise document (main text maximum 30 pages) with supporting topographic maps and appendices.

4.1.1 Table of Contents of 5YFMP

- Executive summary
- Document record sheet
- Objectives, and indicators
- Forest management prescriptions
- Social environment
- Environmental impact assessment
- Infrastructure development
- Other contractual issues
- Attachments: maps, appendices

4.1.2 Executive Summary

The 5YFMP shall include a 2-page maximum summary written in English and at least one local language commonly used by local community members.

4.1.3 Document Record Sheet

A 1-page sheet showing the following information:

- Name and contact address of Contract holder.
- Contract reference number.
- Five-Year Management Plan reference number.
- Date of submission to FDA for approval

4.2 Objectives

Each forest will exhibit different characteristics upon which specific operational targets will be formulated. However, the Five-Year Forest Management Plan may be expected:

1. To describe and evaluate the commercial potential of the forest resources in the compartment, and estimate the sustainable yield.
2. To describe and evaluate the effects of activities on the environment over the planning period.
3. To safeguard specific sites of special interest such as protected areas and conservation areas, as well watersheds and protecting in general the forest's wildlife and biological diversity.
4. To address social issues associated with commercial timber operations and obtain local community support for forest management.

The Plan shall provide operational targets and quantitative indicators for each of the objectives in the SFMP.

4.3 Forest management prescriptions

The forest management prescriptions shall follow from the pre-harvesting inventories undertaken in the operating area (forest compartment).

The Plan shall assess the inventory results (presented in tabular appendices), and provide estimates of sustainable yields. From these results it shall prescribe the harvesting schedule and hence determine the location and size of the five annual coupes that make up the compartment. The production estimates shall determine the type of harvesting equipment needed, and the design of the road and skid trail network.

The Plan shall detail (and the maps show) the boundaries of the annual coupes, and protected areas (both of which should also be marked on the ground), and hence the proposed primary and secondary road network. Protected areas include, as before, watercourses and other topographical features that limit harvesting, conservation areas, sites of religious or cultural significance, etc. The Plan shall specify if harvesting needs to be scheduled in any particular coupe to avoid seed fall, breeding seasons of primates or

other rare or endangered animals or the nesting seasons of rare or endangered bird species.

The Plan will detail arrangements (to be finalized in the AOP), as appropriate, for the complementarity of community harvesting of NTFP products prior to the timber harvest or for example, pit-sawing timber branches and collecting firewood after the harvest.

4.4 Social impact assessment

The Plan shall describe any additional social assessments and consultations carried out for the preparation of the 5YFMP.

In particular, the Plan shall describe the social indicators selected to measure performance against the operational targets, and the extent to which local communities and affected parties are involved in monitoring these indicators.

4.5 Environmental impact assessment

The Plan shall describe any additional environment assessments made in the preparation of the 5YFMP and indicate how these assessments have been incorporated in the forest management prescriptions for the forest compartment. In particular, the Plan shall describe the environmental indicators selected, and how these shall be measured.

4.6 Other issues

Detailed operational issues will be dealt with in the AOP for the forest compartment that makes up the area of the 5YFMP (see below in section V).

Plans for post-harvest silvicultural treatments, logging damage studies and regeneration studies to be undertaken in AOPs may be described. Indicators should be proposed to demonstrate how management prescriptions affect forest composition and structure, and hence ecological values.

Guidelines for Forest Management Planning

Table 2: Summary chart for 5-Year Forest Management Plan

| Activity | Output | Observations |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5-Yr Forest Management Plan | 5-Year Forest Management Plan is based upon Strategic Forest Management Plan, and describes | The 5YFMP needs to be submitted at least 3 months before the logging season commences, in order that FDA can conduct field inspections and approve plan. |
| A pre-harvest inventory of the forest stand(s) within the area of the 5YFMP. The aim is to provide information on the structure and floristic composition of the stand(s) that will be used to determine (a) commercial yield and (b) post-harvest silvicultural treatments as necessary. | Stand tables for basal area, volume and # trees per hectare for each forest stand. | Inventory methods shall be undertaken as per FDA regulations, or as agreed. |
| Design of logging impact and regeneration studies | Proposed plots to measure logging damage and regeneration | |
| Topographic maps at a scale of 1:25,000 showing: 1:2 000 and 1:10 000 | Location of all proposed blocks to be harvested within 5-Yr Management Plan compartment. | The use of natural or artificial (e.g. rivers, roads) features to demarcate the compartment is recommended, and concrete posts shall be installed at major turning points and at 1000m intervals. The compartment shall be numbered as per |
| | Proposed main infrastructure in compartment (e.g. primary and secondary roads, camps, log landings) | |

Guidelines for Forest Management Planning

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| | Protected areas within compartment | FDA regulations Digitized map (UTM) and hard copies submitted to FDA. These maps shall be available to field staff and used in the forest. |
|--|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|

V. ANNUAL OPERATIONAL PLAN

5.1 Introduction to the Plan

The annual operational plans shall be prepared based upon the objectives of the SFMP and the prescriptions and operational targets developed in the 5YFMP.

It prescribes the work schedule for the annual coupe and reports on activities undertaken in the previous operational year (as appropriate).

The Plan shall refer throughout to the contract holder's agreed business plan, not least with regard to relations with local communities, harvesting and construction and extraction equipment, value-added processing and forest certification.

It should be a short and concise document (main text maximum 30 pages) with supporting topographic maps and appendices.

5.1.1 Table of Contents

- Executive summary
- Document record sheet
- Introduction
- Review of activities during previous year
- Forest Inventory activities projected to be undertaken
- Infrastructure projected to be undertaken
- Logging operations in upcoming year
- Other operational plans in upcoming year
- Other contractual issues
- Attachments: maps

5.1.2 Executive Summary

The AOP shall include a 2-page maximum summary written in both English and at least one local language commonly used by local community members.

5.1.3 Document Record Sheet

A 1-page sheet showing the following information:

- Name and contact address of Contract holder.
- Contract reference number.
- Strategic Forest Management Plan reference number.
- Five-Year Management Plan reference number.
- Annual Operational Plan reference number.
- Period covered by Annual Operational plan.
- Date of submission to FDA for approval.
- Signatures.

5.2 Objectives

The objectives of the AOP are to be derived from the SFMP objectives and the operational targets prescribed in the 5YFMP. The broad objectives of the AOP however are to: (1) describe the main activities to be undertaken in the upcoming operational year including logging and other activities; and (2) provide a review of the previous operational year's activities

5.3 Review of activities during previous year

5.3.1 Summary of logging operations from previous Annual Operational Plan

The summary shall include a description of the logging operations undertaken in the previous years, and an explanation of any difference between planned logging activities and actual performance.

- Specifically, table(s) shall be provided showing for each block harvested both the number and volume of trees per species, and the total volume felled.
- List the blocks that have been closed following the completion of felling, and describe post-harvest activities undertaken within these blocks.
 - List the blocks that have not been closed
- Describe any differences between planned and actual activities in infrastructure development (roads, bridges, log landings, etc.).
 - Provide updated maps showing changes as appropriate.
- Summarize timber processing activities in the contract area (as appropriate).
 - Describe any differences between planned and actual processing activities.
 - Provide table(s) showing production by output, volume, and by species

5.3.2 Summary of forest inventory & stock survey activities undertaken

In this section the contract holder shall report on any forest inventory or stock survey fieldwork carried out in the past operational year. This may have been carried out in other parts of the contract area (i.e. in preparation of updated Strategic Forest Management Plan, preparation of next 5-Year Management Plan, as part of post-harvest silvicultural treatments, etc.).

The results of the stock surveys undertaken in the preparation of this Operational Plan will be reported in Logging Operations below.

5.3.3 Summary of other operational activities undertaken

The contract holder shall describe other activities during the previous planning period. This shall include, but is not limited to:

- Any silvicultural activities undertaken in all Contract areas.
- Describe and provide table(s) showing planned and actual
 - Boundary clearing/demarcation activities.
 - Road and other infrastructure maintenance activities.
 - Community-based activities.
 - Environmental impact mitigation activities.

5.4 Forest Inventory activities projected to be undertaken

Describe all planned inventory activities whether within the operational area of the current 5-Year Forest Management Plan or for proposed operational area for next 5-Year Forest Management Plan.

Describe all stock survey inventory work to be undertaken in preparation of the following year's Operational Plan.

5.5 Infrastructure projected to be undertaken

Describe the proposed infrastructure development in the annual coupe and other operational areas.

- Describe and provide table(s) showing planned and actual
 - Boundary clearing/demarcation activities.
 - Road and other infrastructure construction (log landings, camps) and maintenance activities.

Guidelines for Forest Management Planning

- Social infrastructure and community-based activities.
- Environmental impact mitigation activities

Detail measures to be taken to mitigate logging impacts. Provide a map showing the proposed infrastructure network, protected areas and associated buffer zones. These areas shall be marked on the ground also.

Specifically, provide table(s) showing for the annual coupe the proposed road construction and maintenance (in km), type & number of culverts, borrow pits as well as type & number of bridges or other crossings, log landings, and camps for each block.

5.6 Logging operations in upcoming year

The logging operations to be undertaken in the upcoming year shall be determined by the data provided through the completion of stock surveys in each 1-km square block, the approval of the yield by FDA, the approval of the proposed infrastructure development (roads and skid trails, bridges, and log landings).

The stock map for each block shall show the location of all commercial trees above their respective minimum diameters and enumerated according to FDA regulations.

The proposed logging operations and associated infrastructure development shall be consistent with the *Code of Forest Harvesting Practice*.

Table(s) for each block shall show the tree species, estimated volume and tree number of all trees proposed for harvesting, as well as the total volume and total number of trees proposed for felling in each block. The contract holder will also include tables from the 5YFMP indicating the basal area, volume and number of trees per hectare for the forest stand.

5.7 Other operational plans in upcoming year

In this section the contract holder will describe plans for monitoring the contract area. This shall include monitoring for illegal activities (unauthorized pit-sawing, hunting, mining, etc) and monitoring with community and civil society groups.

Describe plans and programmes for waste disposal in general, and specifically for timber processing.

Indicate any new measures considered by the company since submission of its SFMP. This shall include reporting on progress in meeting forest certification goals and targets as appropriate.

5.8 Other contractual issues

5.8.1 Logging equipment and other machinery

List all machinery and items of major equipment used in logging, construction, maintenance, transport and processing. Describe any differences with regard to business plan.

5.8.2 Staff and employees

List all staff and employees (including sub-contracted employees, and locally recruited employees) by name, function and as appropriate grade.

- Indicate the turnover of staff and employees during the previous operational year. Indicate the training programs undertaken by staff and employees.
- Specify which members of staff and employees have been trained during the previous operational year, and are proposed for training in the upcoming operational year.
- Describe procedures for occupational health and safety, and any proposed changes to procedures.
 - List the number and type of work-related accidents, and the staff and employees affected

5.8.3 Industrial and social relations

Describe all industrial disputes, if any, and the manner of their resolution.

Describe all disputes with communities, if any, and the manner of their resolution.

Describe the status of community-based activities during the previous year as negotiated in the Social Agreement, and the proposed program for the upcoming year. Explain disparities, if any, between planned and actual activities.

5.8.4 Annual Concession Audit

Attach the report of the Annual Concession Audit as an appendix.

Guidelines for Forest Management Planning

Table 3: Summary chart for Annual Operational Plan

| Activity | Output | Observations |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Annual Operational Plan | AOP is based upon 5-Year Forest Management Plan, and describes (1) main activities to be undertaken in upcoming operational year, and (2) reviews previous year's operational activities. | The AOP needs to be submitted at least 3 months before the logging season commences, in order that FDA can conduct field inspections and approve yield. |
| A 100% pre-harvest inventory ("Stock survey") of commercial trees above their respective minimum dbh conducted in each block. Their aim is to provide information that facilitates the planning and control of an efficient harvesting operation. | Proposed annual coupe is divided into one km square blocks (100 hectares) and demarcated physically on the ground and on maps. | The use of natural or artificial (e.g. rivers, roads) features to demarcate blocks is recommended, and concrete posts shall be installed at major turning points and at 500m intervals. Blocks shall be numbered as per FDA regulations. |
| | All commercial trees enumerated, and seed trees and protected species shall also be marked and numbered. | Inventory methods and tree marking shall be undertaken as per FDA regulations. |
| | Proposed yield and area determined in annual operational plan. | The annual volume & area to be harvested shall be approved by the FDA according to yield regulation. |
| Topographic maps at a scale of 1:25,000 showing: 1:2 000 and 1:10 000 | Location of all proposed blocks to be harvested within current 5-Yr Management Plan forest compartment area. | Digitized map (UTM) and hard copies submitted to FDA. |
| | Proposed main infrastructure in annual operational area (e.g. primary and secondary roads, log landings) | |

Guidelines for Forest Management Planning

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|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| A map(s) at a minimum scale of 1:2,500 (1:1,000 recommended) shall be produced showing for each block: | The location of all commercial trees and trees intended to be harvested | Annual coupe, block and trees identification (name/number) as per FDA regulations |
| | All watercourses, including creeks and waterways, and their streamside buffer strips | See FDA <i>Code of Forest Harvesting Practice</i> |
| | All terrain with slope > 30% shall be identified as no logging zones | These maps shall be available to field staff and used in the forest. |
| | All existing roads, permanent water crossings and skid trails | |
| | All projected roads, skid trails and log landings, field camps | |
| | All projected permanent and temporary watercourse crossings | |

Guidelines for Forest Management Planning

The reliability of data collected will be checked by taking a random sample of transects within a block and measuring the following elements:

| Phase of survey | Element checked | Required consistency |
|------------------------------|--------------------------------|-------------------------------------------------------------------------------------|
| Strip/transect establishment | Bearing & horizontal distances | All bearings at the starting of strip lines within 2 degrees |
| | | Strip width does not diverge by more than 5m at any point |
| Topographic mapping | Mapped features | 90% of required features are mapped and can be located within 5m of stated location |
| Tree enumeration | Number of trees | 90% consistent |
| | Species identification | 90% consistent |
| | Dbh measurement | 90% within 5cm |
| | Tree coordinates | 90% within 5m |

VI. HARVEST PLAN (TSC)

6.1 Introduction to the Plan

The Harvest Plan (HP) for timber sales contract areas is similar to the AOP for FMC, except of course that it is a freestanding plan that applies only to timber harvesting in conversion forests.

It prescribes the work schedule for the annual coupe and reports on activities undertaken in the previous operational year (as appropriate).

The Plan shall refer throughout to the contract holder's agreed business plan, not least with regard to relations with local communities. The proposed logging operations and associated infrastructure development shall be consistent with the *Code of Forest Harvesting Practices*.

It should be a short and concise document (main text maximum 30 pages) with supporting topographic maps and appendices.

6.1.1 Table of Contents

- Executive summary
- Document record sheet
- Introduction
- Review of activities during previous year
- Forest Inventory activities projected to be undertaken
- Infrastructure projected to be undertaken
- Logging operations in upcoming year
- Other operational plans in upcoming year
- Other contractual issues
- Attachments: maps

6.1.2 Executive Summary

The HP shall include a 2-page maximum summary written in both English and at least one local language commonly used by local community members.

6.1.3 Document Record Sheet

A 1-page sheet showing the following information:

- Name and contact address of Contract holder.
- Contract reference number.
- Harvest Plan reference number.
- Period covered by Harvest Plan.
- Date of submission to FDA for approval.
- Signatures.

6.2 Objectives

The objectives of the HP are to: (1) describe the main activities to be undertaken in the upcoming operational year including logging and other activities; and (2) provide a review of the previous operational year's activities

6.3 Review of activities during previous year

6.3.1 Summary of logging operations from previous year of Harvesting Plan

The summary shall include a description of the logging operations undertaken in the previous year, and an explanation of any difference between planned logging activities and actual performance.

- Specifically, table(s) shall be provided showing for each block harvested both the number and volume of trees per species, and the total volume felled.
- List the blocks that have been closed following the completion of felling, and describe post-harvest activities undertaken within these blocks.
 - List the blocks that have not been closed
- Describe any differences between planned and actual activities in infrastructure development (roads, bridges, log landings, etc.).
 - Provide updated maps showing changes as appropriate.
- Summarize timber processing activities in the contract area (as appropriate).
 - Describe any differences between planned and actual processing activities.
 - Provide table(s) showing production by output, volume, and by species

6.3.2 Summary of stock survey activities undertaken

In this section the contract holder shall report on stock survey fieldwork carried out in the past operational year.

The results of the stock surveys undertaken in the preparation of this Harvest Plan will be reported in Logging Operations below.

6.3.3 Summary of other operational activities undertaken

The contract holder shall describe other activities during the previous planning period. This shall include, but is not limited to: a description of, and provide table(s) showing, planned and actual

- Road and other infrastructure maintenance activities.
- Community-based activities.
- Environmental impact mitigation activities.

6.4 Forest Inventory activities projected to be undertaken

Describe all stock survey inventory work to be undertaken in preparation of the next year's Harvest Plan as appropriate.

6.5 Infrastructure projected to be undertaken

Describe the proposed infrastructure development in the annual coupe

- Describe and provide table(s) showing planned and actual
 - Boundary clearing/demarcation activities.
 - Road and other infrastructure construction (log landings, camps) and maintenance activities.
 - Social infrastructure and community-based activities.
 - Environmental impact mitigation activities

Detail measures to be taken to mitigate logging impacts. Provide a map showing the proposed infrastructure network, protected areas and associated buffer zones. These areas shall be marked on the ground also.

Specifically, provide table(s) showing for the annual coupe the proposed road construction and maintenance (in km), type & number of culverts, borrow pits as well as type & number of bridges or other crossings, log landings, and camps for each block.

6.6 Logging operations in upcoming year

The logging operations to be undertaken in the upcoming year shall be determined by the data provided through the completion of stock surveys in each 1-km square block, the

Guidelines for Forest Management Planning

approval of the yield by FDA, the approval of the proposed infrastructure development (roads and skid trails, bridges, and log landings).

The stock map for each block shall show the location of all commercial trees above their respective minimum diameters and enumerated according to FDA regulations.

The proposed logging operations and associated infrastructure development shall be consistent with the *Code of Forest Harvesting Practices*.

Table(s) for each block shall show the tree species, estimated volume and tree number of all trees proposed for harvesting, as well as the total volume and total number of trees proposed for felling in each block.

6.7 Other operational plans in upcoming year

In this section the contract holder will describe plans for monitoring the contract area. This shall include monitoring for illegal activities (unauthorized pit-sawing, hunting, mining, etc) and monitoring with community groups.

Describe plans and programmes for waste disposal in general, and specifically for timber processing.

6.8 Other contractual issues

6.8.1 Logging equipment and other machinery

List all machinery and items of major equipment used in logging, construction, maintenance, transport and processing. Describe any differences with regard to business plan.

6.8.2 Staff and employees

List all staff and employees (including sub-contracted employees, and locally recruited employees) by name, function and as appropriate grade.

- Indicate the turnover of staff and employees during the previous operational year. Indicate the training programs (formal & informal) undertaken by staff and employees.
- Specify which members of staff and employees have been trained during the previous operational year, and are proposed for training in the upcoming operational year if any.

Guidelines for Forest Management Planning

- Describe procedures for occupational health and safety, and any proposed changes to procedures.
 - List the number and type of work-related accidents, and the staff and employees affected

6.8.3 Industrial and social relations

Describe all industrial disputes, if any, and the manner of their resolution.

Describe all disputes with communities, if any, and the manner of their resolution.

Describe the status of community-based activities during the previous year as negotiated in the Social Agreement, and the proposed program for the upcoming year. Explain disparities, if any, between planned and actual activities.

6.8.4 Annual Concession Audit

Attach the report of the Annual Concession Audit as an appendix.

Guidelines for Forest Management Planning

Table 4: Summary chart for TSC Harvest Plan

| Activity | Output | Observations |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TSC Harvest Plan | HP describes (1) main activities to be undertaken in upcoming operational year, and (2) reviews previous year's operational activities. | The HP needs to be submitted at least 3 months before the logging season commences, in order that FDA can conduct field inspections and approve yield. |
| A 100% pre-harvest inventory ("Stock survey") of commercial trees above their respective minimum dbh conducted in each block. Their aim is to provide information that facilitates the planning and control of an efficient harvesting operation. | Proposed annual coupe is divided into one km square blocks (100 hectares) and demarcated physically on the ground and on maps. | The use of natural or artificial (e.g. rivers, roads) features to demarcate blocks is recommended, and concrete posts shall be installed at major turning points and at 500m intervals. Blocks shall be numbered as per FDA regulations. |
| | All commercial trees enumerated, and seed trees and protected species shall also be marked and numbered. | Inventory methods and tree marking shall be undertaken as per FDA regulations. |
| | Proposed yield and area determined in annual operational plan. | The annual volume & area to be harvested shall be approved by the FDA according to yield regulation. |
| Topographic maps at a scale of 1:25,000 showing: 1:2 000 and 1:10 000 | Location of all proposed blocks to be harvested within TSC HP area. | Digitized map (UTM) and hard copies submitted to FDA. |
| | Proposed main infrastructure in annual operational area (e.g. primary and secondary roads, log landings) | |
| A map(s) at a minimum scale of 1:2,500 (1:1,000 recommended) shall be produced showing for each block: | The location of all commercial trees and trees intended to be harvested | Annual coupe, block and trees identification (name/number) as per FDA regulations |

Guidelines for Forest Management Planning

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| | All watercourses, including creeks and waterways, and their streamside buffer strips | See FDA <i>Code of Forest Harvesting Practice</i> These maps shall be available to field staff and used in the forest. |
| | All terrain with slope > 30% shall be identified as no logging zones | |
| | All existing roads, permanent water crossings and skid trails | |
| | All projected roads, skid trails and log landings, field camps | |
| | All projected permanent and temporary watercourse crossings | |

Guidelines for Forest Management Planning

The reliability of data collected will be checked by taking a random sample of transects within a block and measuring the following elements:

| Phase of survey | Element checked | Required consistency |
|------------------------------|--------------------------------|-------------------------------------------------------------------------------------|
| Strip/transect establishment | Bearing & horizontal distances | All bearings at the starting of strip lines within 2 degrees |
| | | Strip width does not diverge by more than 5m at any point |
| Topographic mapping | Mapped features | 90% of required features are mapped and can be located within 5m of stated location |
| Tree enumeration | Number of trees | 90% consistent |
| | Species identification | 90% consistent |
| | Dbh measurement | 90% within 5cm |
| | Tree coordinates | 90% within 5m |

Appendix 1: Principles and Criteria & Generic Indicators

This appendix provides a framework for forest certification standards. It is based upon the FSC principles and criteria for forest stewardship (FSC-STD-0120-0015 April 2004) together with generic indicators developed by Smartwood, an organisation with much experience in the certification of small forest areas.

The principles, criteria and indicators are included in the *Guidelines* as a reference for the preparation of forest management plans given that national forest policy requires that forest use is sustainable and environmentally and socially sensitive, and the legal requirement that FMC holders gain forest management certification.

The standards are divided into the following ten principles:

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| 1. Compliance with Laws and FSC Principles |
| 2. Tenure and Use Rights & Responsibilities |
| 3. Indigenous Peoples' Rights |
| 4. Community Relations and Workers' Rights |
| 5. Benefits from the Forest |
| 6. Environmental Impact |
| 7. Management Plan |
| 8. Monitoring and Assessment |
| 9. Maintenance of High Conservation Value Forests |
| 10. Plantations |

Appendix Table 1: Principles and Criteria & Generic Indicators

PRINCIPLE #1: COMPLIANCE WITH LAWS AND FSC PRINCIPLES

Forest management shall respect all applicable laws of the country in which they occur, and international treaties and agreements to which the country is a signatory, and comply with all FSC Principles and Criteria.

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| C1.1 Forest management shall respect all national and local laws and administrative requirements. |
| <ul style="list-style-type: none"> FMO shall demonstrate a record of compliance with relevant federal, provincial/state, and local laws and regulations. |
| C1.2 All applicable and legally prescribed fees, royalties, taxes and other charges shall be paid. |
| <ul style="list-style-type: none"> FMO shall be up-to-date in payment of applicable fees, taxes, timber rights or leases, royalties, etc. Where FMO is not up-to-date on payments, a plan for completing all payments shall have been agreed to with the relevant institution. |
| C1.3 In signatory countries, the provisions of all binding international agreements such as CITES, ILO Conventions, ITTA, and Convention on Biological Diversity, shall be respected. |
| <ul style="list-style-type: none"> FMO shall be aware of and understand the legal and administrative obligations with respect to relevant international agreements. FMO operations shall meet the intent of applicable conventions including CITES, Convention on Biological Diversity and ILO conventions (29, 87, 98, 100, 105, 111, 138, 182 and other binding conventions). |
| C1.4 Conflicts between laws, regulations and the FSC Principles and Criteria shall be evaluated for the purposes of certification, on a case-by-case basis, by the certifiers and the involved or affected parties. |
| <ul style="list-style-type: none"> Conflicts between laws, FSC P&C and international treaties or conventions shall be identified by FMO. FMO should work in conjunction with the appropriate regulatory bodies and other parties to resolve conflicts between laws/regulations and FSC Principles or Criteria. |
| C1.5 Forest management areas should be protected from illegal harvesting, settlement and other unauthorised activities. |
| <ul style="list-style-type: none"> The forest management unit(s) shall be protected from unauthorized harvesting activities and other activities not controlled by forest manager or local people with use rights. For large operations, a system shall exist for documenting and reporting to the appropriate authority instances of illegal harvesting, settlement, occupation or other unauthorized activities. |
| C1.6 Forest managers shall demonstrate a long-term commitment to adhere to the FSC Principles and Criteria. |
| <ul style="list-style-type: none"> For large operations, FMO shall have a publicly available policy or statement committing the organization to adhere to the FSC certification standards on the forest under assessment. |

- FMO shall not implement activities that blatantly conflict with the FSC P&C on forest areas outside of the forest area under assessment.
- FMO has disclosed information on all forest areas over which the FMO has some degree of management responsibility (as per FSC policies, e.g. “partial certification”).

PRINCIPLE #2: TENURE AND USE RIGHTS AND RESPONSIBILITIES

Long-term tenure and use rights to the land and forest resources shall be clearly defined, documented and legally established.

C2.1 Clear evidence of long-term forest use rights to the land (e.g. land title, customary rights, or lease agreements) shall be demonstrated.

- FMO shall have documented evidence of legal, long-term (at least one rotation length or harvest cycle) rights to manage the lands and to utilize the forest resources for which certification are sought.

C2.2 Local communities with legal or customary tenure or use rights shall maintain control, to the extent necessary to protect their rights or resources, over forest operations unless they delegate control with free and informed consent to other agencies.

- All legal or customary tenure or use rights to the forest resource of all local communities are clearly documented by the forest managers.
- FMO shall provide evidence that free and informed consent to management activities affecting use rights has been given by local communities or affected parties.
- FMO planning processes shall include participation of local communities or parties with legal or customary tenure or use rights.

C2.3 Appropriate mechanisms shall be employed to resolve disputes over tenure claims and use rights. The circumstances and status of any outstanding disputes will be explicitly considered in the certification evaluation. Disputes of substantial magnitude involving a significant number of interests will normally disqualify an operation from being certified.

- FMO shall use mechanisms for resolving disputes over tenure claims and use rights that respectfully involve the disputants and are consistent in process.
- FMO should not be involved in outstanding disputes of substantial magnitude on the candidate forest area that involve a significant number of interests.
- FMO shall demonstrate significant progress achieved to resolve major disputes.

PRINCIPLE #3: INDIGENOUS PEOPLES' RIGHTS

The legal and customary rights of indigenous peoples to own, use and manage their lands, territories, and resources shall be recognised and respected.

C3.1 Indigenous peoples shall control forest management on their lands and territories unless they delegate control with free and informed consent to other agencies.

- FMO shall identify Indigenous peoples with customary/traditional rights to forest resources (timber and non-timber) where indigenous people have established customary or legal rights to the land or forest resources and their entitlements

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| formally recognized in written agreements. Specific areas should be marked on maps. |
| <ul style="list-style-type: none"> • Forest operations begin only once disputes have been resolved or all reasonable means have been taken to resolve them. • Agreements with indigenous groups shall be honored. |
| C3.2 Forest management shall not threaten or diminish, either directly or indirectly, the resources or tenure rights of indigenous peoples. |
| <ul style="list-style-type: none"> • There shall be no evidence or indication that the FMO threatens the rights and resources of indigenous peoples. |
| C3.3 Sites of special cultural, ecological, economic or religious significance to indigenous peoples shall be clearly identified in co-operation with such peoples, and recognised and protected by forest managers. |
| <ul style="list-style-type: none"> • Special sites of indigenous cultural, ecological, economic or religious significance shall be documented. They should be identified on maps or in the forest. • Policies and procedures shall include the involvement of indigenous people, or specialists they designate, in the identification of special sites. • Special sites should be identified in management/operational plans. • Special sites shall be protected during forest operations. |
| C3.4 Indigenous peoples shall be compensated for the application of their traditional knowledge regarding the use of forest species or management systems in forest operations. This compensation shall be formally agreed upon with their free and informed consent before forest operations commence. |
| <ul style="list-style-type: none"> • Written or verbal agreements on terms of compensation shall exist when there is use of traditional knowledge for commercial purposes. • Compensation systems for the use of traditional knowledge shall be in place prior to commencement of forest operations that affect indigenous interests. |

PRINCIPLE #4: COMMUNITY RELATIONS AND WORKER'S RIGHTS

Forest management operations shall maintain or enhance the long-term social and economic well being of forest workers and local communities.

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| C4.1 The communities within, or adjacent to, the forest management area should be given opportunities for employment, training, and other services. |
| <ul style="list-style-type: none"> • Local communities and residents shall be given equal or preferential opportunities in forest management activities in terms of employment, training, and provision of supplies to FMO, and other benefits or opportunities. |
| C4.2 Forest management should meet or exceed all applicable laws and/or regulations covering health and safety of employees and their families. |
| <ul style="list-style-type: none"> • Wages and other benefits (health, retirement, worker's compensation, housing, food) for full-time staff and contractors shall be consistent with (not lower than) prevailing local standards. • FMO shall implement a program of worker safety. • Health and safety measures comply with national minimum requirements. • Workers (staff and contractors) are provided with safety equipment in good working order, appropriate to the tasks of workers and the equipment used (e.g. |

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| local norms are important, ideally the following: hard hats, hearing protection, high visibility vests, steel toe boots and chainsaw proof chaps). |
| <ul style="list-style-type: none"> • FMO shall maintain up to date records of work-related accidents, and preferably all safety performance. |
| <ul style="list-style-type: none"> • FMO policies and practices shall ensure equal treatment of employees in terms of hiring, advancement, dismissal, remuneration and employment related social security. |
| C4.3 The rights of workers to organise and voluntarily negotiate with their employers shall be guaranteed as outlined in Conventions 87 and 98 of the International Labour Organisation (ILO). |
| <ul style="list-style-type: none"> • FMOs, by their actions and policies, shall respect the rights of workers (staff and contractors) to organize or join trade unions and to engage in collective bargaining as outlined in ILO Conventions 87 and 98. |
| C4.4 Management planning and operations shall incorporate the results of evaluations of social impact. Consultations shall be maintained with people and groups (both men and women) directly affected by management operations. |
| <ul style="list-style-type: none"> • In conjunction with local stakeholders and other interested parties, the FMO shall evaluate socio-economic impacts associated with forest management activities. The evaluation shall be in accordance to the scale and intensity of operations. |
| <ul style="list-style-type: none"> • FMO shall demonstrate that input from community participation was considered and/or responded to during management planning and operations. |
| C4.5 Appropriate mechanisms shall be employed for resolving grievances and for providing fair compensation in the case of loss or damage affecting the legal or customary rights, property, resources, or livelihoods of local peoples. Measures shall be taken to avoid such loss or damage. |
| <ul style="list-style-type: none"> • FMO shall make all reasonable efforts to avoid losses and damages affecting local peoples, and in resolving grievances related to legal rights, damage compensation and negative impacts. |
| <ul style="list-style-type: none"> • Procedures for consistently and effectively resolving grievances and determining compensation for loss or damage shall be implemented. |

PRINCIPLE # 5: BENEFITS FROM THE FOREST

Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits.

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| C5.1 Forest management should strive toward economic viability, while taking into account the full environmental, social, and operational costs of production, and ensuring the investments necessary to maintain the ecological productivity of the forest. |
| <ul style="list-style-type: none"> • Budgets include provision for environmental and social as well as operational costs necessary to maintain certifiable status (e.g. management planning, road maintenance, silvicultural treatments, long-term forest health, growth and yield monitoring, and conservation investments). |
| <ul style="list-style-type: none"> • The income predicted in the operating budgets is based upon sound assumptions. |
| C5.2 Forest management and marketing operations should encourage the optimal use and local processing of the forest's diversity of products. |

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| <ul style="list-style-type: none"> • FMO should seek the "highest and best use" for individual tree and timber species. |
| <ul style="list-style-type: none"> • FMO should encourage utilization of frequently occurring, lesser known, or less-commonly utilized plant species for commercial and subsistence uses. |
| <ul style="list-style-type: none"> • Non-timber forest products (NTFPs) should be considered during forest use and processing. |
| <ul style="list-style-type: none"> • Local processing should be emphasised where possible. |
| <p>C5.3 Forest management should minimise waste associated with harvesting and on-site processing operations and avoid damage to other forest resources.</p> |
| <ul style="list-style-type: none"> • Harvesting techniques shall be designed to avoid log breakage, timber degradation and damage to the forest stand and other resources. |
| <ul style="list-style-type: none"> • Waste generated through harvesting operations, on-site processing and extraction shall be minimized. (Note: See Principle 6 for assessing damage to forest resources) |
| <p>C5.4 Forest management should strive to strengthen and diversify the local economy, avoiding dependence on a single forest product.</p> |
| <ul style="list-style-type: none"> • FMO should foster product diversification and exploration of new markets and products (also Criterion 5.2). |
| <ul style="list-style-type: none"> • FMO should support local value added processing. |
| <p>C5.5 Forest management operations shall recognise, maintain, and, where appropriate, enhance the value of forest services and resources such as watersheds and fisheries.</p> |
| <ul style="list-style-type: none"> • FMO shall protect the full range of forest services associated with the defined forest area including: municipal watersheds, commercial and recreational fisheries (or the supply of water to downstream fisheries), visual quality, contributions to regional biodiversity, recreation and tourism. |
| <ul style="list-style-type: none"> • FMO shall protect riparian zones along all watercourses, streams, pools, springs and lakes/ponds, consistent with the requirement of national regulations or best management practices. |
| <ul style="list-style-type: none"> • FMO should map protection zones. |
| <p>C5.6 The rate of harvest of forest products shall not exceed levels that can be permanently sustained.</p> |
| <ul style="list-style-type: none"> • Appropriate to the scale and intensity of operations, estimates of total periodic timber growth on the defined forest area - by species categories - shall be generated through a combination of empirical data and published literature. |
| <ul style="list-style-type: none"> • Allowable harvest levels shall be based on conservative, well-documented and most current estimates of growth and yield. |
| <ul style="list-style-type: none"> • Harvesting is based on a calculated periodic allowable harvest (e.g. annual allowable cut) and actual harvests do not exceed calculated replenishment rates over the long term. |

PRINCIPLE #6: ENVIRONMENTAL IMPACT

Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and, by so doing, maintain the ecological functions and the integrity of the forest.

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| C6.1 Assessment of environmental impacts shall be completed -- appropriate to the scale, intensity of forest management and the uniqueness of the affected resources -- and adequately integrated into management systems. Assessments shall include landscape level considerations as well as the impacts of on-site processing facilities. Environmental impacts shall be assessed prior to commencement of site-disturbing operations. |
| <ul style="list-style-type: none"> • Environmental assessments shall be completed during management planning. |
| <ul style="list-style-type: none"> • Environmental assessments shall consistently occur prior to site disturbing activities. |
| <ul style="list-style-type: none"> • Environmental impacts of on-site processing facilities shall be controlled (e.g. waste, construction impacts, etc.). |
| <ul style="list-style-type: none"> • Landscape level impacts of forest management (e.g. cumulative effects of forest operations within and nearby the FMU) shall be considered. |
| <ul style="list-style-type: none"> • Applicable to SLIMF FMOs only (note: above indicators do not apply) FMO shall demonstrate knowledge of the possible negative impacts of its activities and seeks to minimize them. |
| C6.2 Safeguards shall exist which protect rare, threatened and endangered species and their habitats (e.g., nesting and feeding areas). Conservation zones and protection areas shall be established, appropriate to the scale and intensity of forest management and the uniqueness of the affected resources. Inappropriate hunting, fishing, trapping and collecting shall be controlled. |
| <ul style="list-style-type: none"> • The likely presence of rare, threatened or endangered species and their habitats (e.g. nesting and feeding areas) shall be assessed on the basis of the best available information. |
| <ul style="list-style-type: none"> • Timber species on either local and/or international endangered or threatened species lists (e.g. CITES Appendix 1, national lists) shall not be harvested. |
| <ul style="list-style-type: none"> • Appropriate to the scale and intensity of management, conservation zones, protection areas or other protection measures shall be established based on technically sound requirements for the protection of rare, threatened and endangered species and their habitats. |
| <ul style="list-style-type: none"> • Conservation zones should be demarcated on maps, and where feasible, on the ground. |
| <ul style="list-style-type: none"> • Effective procedures shall be implemented during forest operations to protect conservation zones, identified species and their habitats |
| <ul style="list-style-type: none"> • Hunting, fishing, trapping and NTFP collecting shall be controlled in the forest. |
| <ul style="list-style-type: none"> • Applicable to SLIMF FMOs only: (note: above indicators do not apply) Where information exists on rare, threatened and endangered species and their habitat, the FMO shall use this information to map and protect these resources. |
| C6.3 Ecological functions and values shall be maintained intact, enhanced, or restored, including: a) Forest regeneration and succession; b) Genetic, species, and ecosystem diversity, and c) Natural cycles that affect the productivity of the forest ecosystem. |
| <ul style="list-style-type: none"> • Silviculture and/or other management systems shall be appropriate to the ecology of the forest and other resources (e.g. soils, hydrology). |
| <ul style="list-style-type: none"> • Ecological and silviculture rationale behind management prescriptions shall be well-documented, based on site-specific forest data or published analyses of local forest ecology (e.g. regeneration and succession) or silviculture. |

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| <ul style="list-style-type: none"> • Management prescriptions should maintain, enhance or restore forest composition (i.e. species numbers and diversity) and structure. |
| <ul style="list-style-type: none"> • Management is designed to ensure that the full complement of tree species regenerates successfully in the forest area over the duration of the rotation. |
| <ul style="list-style-type: none"> • Standing and fallen dead wood habitats should be retained based on local best management practice or documented research. |
| <p>C6.4 Representative samples of existing ecosystems within the landscape shall be protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources.</p> |
| <ul style="list-style-type: none"> • Representative samples of existing ecosystems shall be protected in their natural state, based on the identification of key biological areas and/or consultation with environmental stakeholders, local government and scientific authorities (a 10% target figure is encouraged but not mandatory). |
| <ul style="list-style-type: none"> • In conjunction with experts, restoration and protection activities shall be defined, documented, and implemented in the forest. |
| <ul style="list-style-type: none"> • Applicable to SLIMF FMOs only: (note: above indicators do not apply) Representative samples of ecosystems that are unique and not under protection by public or private agencies known to exist in the FMU shall be identified, documented and excluded from the harvest area. Such areas should be mapped. |
| <p>C6.5 Written guidelines shall be prepared and implemented to: control erosion; minimise forest damage during harvesting, road construction, and all other mechanical disturbances; and protect water resources.</p> |
| <ul style="list-style-type: none"> • Written guidelines shall be available which cover the aspects of management that have demonstrated impact in the forest, typically including silvicultural operations, technical specifications for skid trail (location, width and density), road design and conservation structures. |
| <ul style="list-style-type: none"> • Maps and/or work plans shall be produced at a scale that allows effective supervision of soil and water resource management and protection activities. |
| <ul style="list-style-type: none"> • Topographic maps should be prepared before logging or road construction occurs. |
| <ul style="list-style-type: none"> • Topographic maps should specify areas suitable for all-weather harvesting or dry-weather only; and indicate locations for extraction (or haul) roads, loading ramps (or log yards), main skid (or snig) trails, drainage structures, buffer zones, and conservation areas. |
| <ul style="list-style-type: none"> • Training shall be given to FMO staff and contractors to meet guidance requirements. |
| <ul style="list-style-type: none"> • Road construction, maintenance and closure standards shall be followed in the forest. |
| <p>C6.6 Management systems shall promote the development and adoption of environmentally friendly non-chemical methods of pest management and strive to avoid the use of chemical pesticides. World Health Organisation Type 1A and 1B and chlorinated hydrocarbon pesticides; pesticides that are persistent, toxic or whose derivatives remain biologically active and accumulate in the food chain beyond their intended use; as well as any pesticides banned by international agreement, shall be prohibited. If chemicals are used, proper equipment and training shall be provided to minimise health and environmental risks.</p> |
| <ul style="list-style-type: none"> • Forest managers shall demonstrate a commitment to reducing reliance on |

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| chemical pesticides |
| <ul style="list-style-type: none"> • If chemicals are used in the forest, they should be used as part of an integrated pest management (IPM) system that carefully identifies threats and analyzes chemical and non-chemical alternatives. |
| <ul style="list-style-type: none"> • If chemicals are used: <ul style="list-style-type: none"> ○ A complete inventory of chemicals shall be provided by the FMO and detailed inspections of storage areas or other facilities validate that inventory is complete and accurate; ○ Records shall be kept of all chemical used by the FMO including name of the product, location and method of application, total quantity of chemical used and dates of application. ○ Safe handling, application and storage procedures shall be followed; and, ○ Staff and contractors shall receive training in handling, application and storage procedures. |
| <ul style="list-style-type: none"> • Chemicals prohibited by the FSC (FSC-POL-30-601) or those banned in Europe, U.S. and target country, or World Health Organization Type 1A or 1B and chlorinated hydrocarbon pesticides shall not be used. The exception is when a formal derogation has been granted by the FSC. In such cases, the FMO follows the terms of the approved derogation. |
| <p>C6.7 Chemicals, containers, liquid and solid non-organic wastes including fuel and oil shall be disposed of in an environmentally appropriate manner at off-site locations.</p> |
| <ul style="list-style-type: none"> • Chemical, container, liquid and solid waste shall be disposed of off-site in an environmentally sound and legal manner, whether from forest operations or processing facilities. |
| <p>C6.8 Use of biological control agents shall be documented, minimised, monitored and strictly controlled in accordance with national laws and internationally accepted scientific protocols. Use of genetically modified organisms shall be prohibited.</p> |
| <ul style="list-style-type: none"> • Use of biological control agents shall be documented, minimized, monitored and strictly controlled. • Use of genetically modified organisms (GMOs) shall be prohibited. |
| <p>C6.9 The use of exotic species shall be carefully controlled and actively monitored to avoid adverse ecological impacts.</p> |
| <ul style="list-style-type: none"> • Use of exotic species should be discouraged and carefully controlled, i.e. when used it is for well-justified and specific purposes (e.g. environmental benefit) and monitored for environmental impact. • Where exotic species are planted, measures shall occur to prevent spontaneous regeneration outside plantation areas, unusual mortality, disease, insect outbreaks or other adverse environmental impacts. |
| <p>C6.10 Forest conversion to plantations or non-forest land uses shall not occur, except in circumstances where conversion: a) entails a very limited portion of the forest management unit; and, b) does not occur on high conservation value forest areas; and, c) will enable clear, substantial, additional, secure, long-term conservation benefits across the forest management unit.</p> |
| <ul style="list-style-type: none"> • FMO should not convert primary, degraded primary, mature secondary forests, or threatened non-forested habitat to plantations or non-forest land uses. • If conversion occurs, it shall not exceed 5% of the forest management unit over |

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| any 5 year period, and conversions should have the support of environmental and social stakeholders. |
| <ul style="list-style-type: none"> • If conversion occurs, FMO should take measures to restore, conserve or manage natural forest or grasslands in surrounding or adjoining areas equal to or exceeding the area disturbed. |
| <ul style="list-style-type: none"> • If plantations or non-forest land uses are established in forest or grassland areas, clear verbal, written or visual guidelines shall be given to FMO staff for identifying acceptable areas and implementing technically sound practices. |
| <ul style="list-style-type: none"> • Any conversion should produce clear long term conservation benefits across the FMU. |
| <ul style="list-style-type: none"> • Plantations or non-forest uses shall not replace high conservation value forest. |

PRINCIPLE #7: MANAGEMENT PLAN

A management plan -- appropriate to the scale and intensity of the operations -- shall be written, implemented, and kept up to date. The long-term objectives of management, and the means of achieving them, shall be clearly stated.

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| C7.1 The management plan and supporting documents shall provide: |
| a) Management objectives. |
| b) Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and a profile of adjacent lands. |
| c) Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories. |
| d) Rationale for rate of annual harvest and species selection. |
| e) Provisions for monitoring of forest growth and dynamics. |
| f) Environmental safeguards based on environmental assessments. |
| g) Plans for the identification and protection of rare, threatened and endangered species. |
| h) Maps describing the forest resource base including protected areas, planned management activities and land ownership. |
| i) Description and justification of harvesting techniques and equipment to be used. |
| <ul style="list-style-type: none"> • FMO Management plan, or appendices or reference documents, shall include presentation of the following components: <ul style="list-style-type: none"> • Management objectives; |
| <ul style="list-style-type: none"> • Description of the forest resources to be managed, environmental limitations, land use and ownership status, socioeconomic conditions, and a profile of adjacent lands; |
| <ul style="list-style-type: none"> • Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories; |
| <ul style="list-style-type: none"> • Description and justification for use of different harvesting techniques and equipment; |
| <ul style="list-style-type: none"> • Description and justification of forest management prescriptions and |

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| <p>their silvicultural and ecological rationale i.e. based on site specific forest data or published analysis of local forest ecology or silviculture;</p> |
| <ul style="list-style-type: none"> • Rate of harvest of forest products (timber or non-timber, as applicable) and species selection including justification; |
| <ul style="list-style-type: none"> • Measures for identifying and protecting rare, threatened and endangered species and/or their habitat; |
| <ul style="list-style-type: none"> • Map(s) describing the forest resource including forest types, watercourses and drains, compartments/blocks, roads, log landings and processing sites, protected areas, unique biological or cultural resources, and other planned management activities; |
| <ul style="list-style-type: none"> • Environmental safeguards based on environmental assessments (see criterion 6.1); and, |
| <ul style="list-style-type: none"> • Plans for monitoring of forest growth, regeneration and dynamics. |
| <ul style="list-style-type: none"> • NTFP resources and uses should be inventoried and their management explicitly considered during planning. |
| <ul style="list-style-type: none"> • Maps that are presented shall be accurate and sufficient to guide forest activities (also see Criterion 6.5). |
| <ul style="list-style-type: none"> • Management plans or related annual operating or harvesting plan shall be available to staff and used in the forest. |
| <ul style="list-style-type: none"> • Applicable to SLIMF FMOs only: (note: above indicators do not apply) A written management plan exists that includes at least the following: |
| <ul style="list-style-type: none"> • The objectives of management; |
| <ul style="list-style-type: none"> • A description of the forest; |
| <ul style="list-style-type: none"> • How the objectives will be met, harvesting methods and silviculture (clear cuts, selective cuts, thinnings) to ensure sustainability; |
| <ul style="list-style-type: none"> • Sustainable harvest limits (which must be consistent with FSC criteria 5.6); |
| <ul style="list-style-type: none"> • Environmental/ social impacts of the plan; |
| <ul style="list-style-type: none"> • Conservation of rare species and any high conservation values; |
| <ul style="list-style-type: none"> • Maps of the forest, showing protected areas, planned management and land ownership; and, |
| <ul style="list-style-type: none"> • Duration of the plan. |
| <p>C7.2 The management plan shall be periodically revised to incorporate the results of monitoring or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.</p> |
| <ul style="list-style-type: none"> • A technically sound and financially realistic timeframe shall exist for revision/adjustment of the management plan. |
| <ul style="list-style-type: none"> • Management plan (and/or annual operating plan) revision or adjustments should occur on timely and consistent basis. |
| <ul style="list-style-type: none"> • Management plan revisions shall incorporate the results of monitoring or new scientific and technical information regarding changing silvicultural, environmental, social and economic conditions. |
| <ul style="list-style-type: none"> • Applicable for SLIMF FMO-s only (Note: above indicators do not apply) Management plan shall be reviewed at least every 5 years and updated, if |

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| necessary, incorporating the results of monitoring to plan and implement future management. |
| C7.3 Forest workers shall receive adequate training and supervision to ensure proper implementation of the management plan. |
| <ul style="list-style-type: none"> Evidence of formal or informal training of forest workers to ensure proper implementation of the management plan shall exist in the forest. Applicable to all FMOs including SLIMFs. For large FMOs, a formal training plan should exist. |
| C7.4 While respecting the confidentiality of information, forest managers shall make publicly available a summary of the primary elements of the management plan, including those listed in Criterion 7.1. |
| <ul style="list-style-type: none"> FMO shall make publicly available a summary of the management plan including information on elements listed in criterion 7.1. Applicable for SLIMF FMO-s only (Note: above indicators do not apply): At minimum FMO shall be willing to provide access to relevant parts of the management plan to stakeholders who are directly affected by the forest management activities of FMO (e.g. neighboring landowners). |

PRINCIPLE #8: MONITORING AND ASSESSMENT

Monitoring shall be conducted -- appropriate to the scale and intensity of forest management -- to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts.

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| C8.1 The scale and intensity of forest management operations, as well as the relative complexity and fragility of the affected environment should determine the frequency and intensity of monitoring. Monitoring procedures should be consistent and replicable over time to allow comparison of results and assessment of change. |
| <ul style="list-style-type: none"> A plan and design, based on consistent and replicable procedures, shall exist for periodic monitoring and reporting. The frequency and intensity of monitoring shall be based on the size and complexity of the operation and the fragility of the resources under management. Applicable to SLIMF FMOs only (Note: above indicators do not apply): FMO should conduct regular and consistent monitoring in connection with harvesting operations and reforestation. |
| C8.2 Forest management should include the research and data collection needed to monitor, at a minimum, the following indicators: |
| a) Yield of all forest products harvested. |
| b) Growth rates, regeneration and condition of the forest. |
| c) Composition and observed changes in the flora and fauna. |
| d) Environmental and social impacts of harvesting and other operations. |
| e) Costs, productivity, and efficiency of forest management. |
| <ul style="list-style-type: none"> The monitoring plan should be technically sound and identify/describe observed changes in conditions in terms of: <ul style="list-style-type: none"> Silviculture (growth rates, regeneration and forest condition, typically as part of a suitable continuous forest inventory system); |

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| <ul style="list-style-type: none"> ○ Commercial harvest including NTFPs; |
| <ul style="list-style-type: none"> ○ Environment (environmental changes affecting flora, fauna, soil and water resources) (outbreak of pest, invasive species, nesting sites for endangered bird species); |
| <ul style="list-style-type: none"> ○ Socioeconomic aspects (forest management costs, yields of all products, and changes in community and worker relations or conditions, accident rates); and, |
| <ul style="list-style-type: none"> ○ Identified high conservation value forest attributes. |
| <ul style="list-style-type: none"> • Applicable to SLIMF FMOs only (Note: above indicators do not apply): FMO shall at a minimum monitor and record information on the following: |
| <ul style="list-style-type: none"> ○ Amount of products harvested; |
| <ul style="list-style-type: none"> ○ Regular monitoring of any identified high conservation values; |
| <ul style="list-style-type: none"> ○ Invasive exotic species; |
| <ul style="list-style-type: none"> ○ Growth and regeneration of managed species; |
| <ul style="list-style-type: none"> ○ Post harvest inspection for erosion and estimate of residual basal area; and, |
| <ul style="list-style-type: none"> ○ Periodic inventory (10 years). |
| <p>C8.3 Documentation shall be provided by the forest manager to enable monitoring and certifying organisations to trace each forest product from its origin, a process known as the "chain of custody."</p> |
| <ul style="list-style-type: none"> • Volume and source data on harvested forest products shall be available (i.e. scaled, inventoried, measured) in the forest, in transport, at intermediate storage yards (e.g. log yards), and processing centers controlled by FMO. |
| <ul style="list-style-type: none"> • Sales invoices and other documentation related to the sale of certified products shall include the chain of custody certificate code (e.g. SW-FM/COC-XXXX). |
| <ul style="list-style-type: none"> • Certified forest products shall be clearly distinguished from non-certified products through marks or labels, separate documented storage, and accompanying invoices up to the point of sale (i.e. up to the "forest gate"). |
| <p>C8.4 The results of monitoring shall be incorporated into the implementation and revision of the management plan.</p> |
| <ul style="list-style-type: none"> • FMO shall demonstrate that monitoring results are incorporated into revisions of the management plan. (For SLIMF see criterion 7.2). |
| <p>C8.5 While respecting the confidentiality of information, forest managers shall make publicly available a summary of the results of monitoring indicators, including those listed in Criterion 8.2.</p> |
| <ul style="list-style-type: none"> • For large operations, results of monitoring shall be incorporated into summaries and other documents that are publicly available. |
| <ul style="list-style-type: none"> • Applicable for medium size and SLIMF FMOs only: (Note: the above indicator does not apply) At minimum FMO shall be willing to provide access to relevant parts of the management plan to stakeholders who are directly affected by the forest management activities of FMO (e.g. neighboring landowners). |

PRINCIPLE 9: MAINTENANCE OF HIGH CONSERVATION VALUE FORESTS

Management activities in high conservation value forests shall maintain or enhance the attributes, which define such forests. Decisions regarding high conservation value forests shall always be considered in the context of a precautionary approach.

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| C9.1 Assessment to determine the presence of the attributes consistent with High Conservation Value Forests will be completed, appropriate to scale and intensity of forest management. |
| <ul style="list-style-type: none"> • FMOs shall have conducted an assessment to identify HCVs. Such an assessment should include: <ul style="list-style-type: none"> ○ Consultation with conservation databases and maps; ○ Consideration of primary or secondary data collected during forest inventories on the designated forest area by FMO staff, consultants or advisors; ○ Interviews with environmental/biological specialists indigenous/local communities, and scientific experts, etc.; ○ Documentation of threats to HCVs; and, ○ If threats to HCVs or HCVF exist, identification of actions to address the threats. • For large operations, FMO shall: <ul style="list-style-type: none"> ○ Produce written HCVF assessment(s) that identify(ies) HCVs or HCVF and proposes strategies to ensure their protection; and, ○ Conduct credible, independent, technically qualified review of the HCVF assessment and related recommendations to address HCV threats and protection; and, ○ Demonstrate that credible actions are being taken to address HCV/HCVF protection and/or threat reduction. • Applicable to SLIMF FMOs only: Consultations shall have occurred with environmental stakeholders, government or scientists to identify HCVs and/or HCVF. This may occur during the actual certification assessment. If HCVs or HCVF are present, FMO shall take all reasonable steps to protect these values and/or reduce threats. |
| C9.2 The consultative portion of the certification process must place emphasis on the identified conservation attributes, and options for the maintenance thereof. |
| <ul style="list-style-type: none"> • FMO consultations with stakeholders shall clearly outline identified conservation attributes as well as proposed strategies for their maintenance or threat reduction. . • For large operations, the stakeholder consultation for HCVF strategy development, and actions taken in response to such consultation, shall be documented. |
| C9.3 The management plan shall include and implement specific measures that ensure the maintenance and/or enhancement of the applicable conservation attributes consistent with the precautionary approach. These measures shall be specifically included in the publicly available management plan summary. |
| <ul style="list-style-type: none"> • If HCVF or HCVs are present, planning documents shall provide site-specific information, which describes the measures taken to protect or restore such values. • Measures to protect HCVF values shall be available in public documents or in the FMO management plan summary. |

C9.4 Annual monitoring shall be conducted to assess the effectiveness of the measures employed to maintain or enhance the applicable conservation attributes.

- A system for continuous monitoring of HC VF values shall be incorporated into the FMO's planning, monitoring and reporting procedures.

Appendix 2: Example Project Brief for TSC or Forest Management Contract

Environmental Project Brief

XXXXX Timber Sale or Forest Management Contract

XXXXXXX County, Liberia

TABLE OF CONTENTS

| | |
|--------------------------------------------|----|
| 16INTRODUCTION | 17 |
| PROPOSED ACTION | 17 |
| PUBLIC INVOLVEMENT AND THE SCOPING PROCESS | 18 |
| ISSUES | 18 |
| SUMMARY OF ENVIRONMENTAL EFFECTS | 19 |

APPENDICES

| |
|--------------------------------------|
| APPENDIX A – PROJECT DESIGN FEATURES |
| APPENDIX B – PUBLIC COMMENTS |
| APPENDIX C – GLOSSARY & ACRONMYS |

INTRODUCTION

The Forest Development Authority has allocated xxx hectares of forest resources to xxxxx company for commercial forest management in the *Upper xxxxx Valley*. The area for this contract is located approximately x miles southeast of xxxxxxx, Liberia (Figure 1 – Vicinity Map) in xxxxxx County.

Insert Figure 1 Vicinity map

The analysis for this Environmental Review is being conducted in compliance with the Environment Protection and Management Law and other relevant Federal laws and regulations.

Additional documentation, including the Harvest Plan and forest resources land use allocations, may be reviewed at Forest Development Authority Office in Monrovia, Liberia. These records are available for public review.

BACKGROUND

In response to the UN Sanctions imposed on timber exports in Liberia, the Forest Development Authority and the Environmental Protection Agency collaborated with the assistance of the Liberia Forestry Initiative to reform the forest sector in Liberia. Land use planning, contract reform and environmental impact assessments were key elements addressed by forest sector reform.

As a result of the land use planning and field validation exercises that took place in early 2007, the area identified in figure one was allocated to commercial forest activities. A contract prospectus for this area was advertised for xx days and following review of the bids, the contract was awarded to xxxxx Timber Company.

PROPOSED ACTION

The Proposed Action includes the management activities authorized for up to three years on approximately 5,000 hectares acres of lands within the Project Area (Figure 2 – Proposed Action Map, page #). The proposed management actions are summarized below:

Vegetation Treatments

Mechanized harvest will be authorized to recover merchantable wood products on up to xxxx hectares per year (4% coup) for xx years. What species and what diameters will be harvested?

Access Management Actions

Approximately xx miles of primary road access would be needed to provide access harvest areas. An additional xx mile of secondary roads would be needed to provide temporary access into harvest areas. Temporary roads would be reclaimed after the harvest treatments have been completed.

Project Design Features

Appendix B of this EA provides a complete listing of protection measures and monitoring activities associated with the Proposed Action.

COMMUNITY CONSULTATION AND THE SCOPING PROCESS

Local communities and other agencies, such as local environmental protection agencies as well as Agriculture Ministry were involved in the initial allocation of the area identified in Figure 1 above to commercial activities. The public and government agencies were also informed of the xxxx Timber Sale Contract through informational news releases, mailings, public meetings, and one-on-one meetings. The FDA maintains records of the community consultation process. XX company has also held consultation with local communities and maintains records of these discussions.

This project is subject to the approval of the Environmental Protection Agency. Based upon the information contained in this Environmental Impact Assessment, the Agency may

The Agency may:-

- 1) Approve the project or activity unconditionally if it is satisfied that the project or activity shall not result in significant damage to the environment;
- 2) Approve the application conditionally by requiring the developer to redesign the project or do such other thing as the Agency considers necessary, taking into consideration the suggestions or comments made and all environmental factors; or
- 3) Refer the application back to the applicant for further study or submission of additional information;
- 4) Reject the application where it is of the opinion that the project may cause significant or irreversible damage to the environment.

ISSUES

Comments and concerns received on the xxxx Forest Resources Utilization Contract have been classified into issues. The issues were classified for consideration in the analysis by the following criteria (Project File Exhibit –B-xx).

- ◆ Already decided by law, regulations, Forest Plan, or other higher level decisions;
- ◆ Addressed through implementation of project-specific design features (protection and restoration measures);
- ◆ Addressed during analyses routinely conducted by the preparers of this report;

- ◆ Addressed through spatial location and/or temporal bounds of activities during alternative design; and/or
- ◆ Beyond the scope of the project.

Project File Exhibit --xx to this EA provides a detailed description of the issues identified during the scoping process and describes how those issues were accounted for during the analysis process.

Summary of Relevant Environmental Effects

The following table provides a comparison of relevant environmental consequences associated with the implementation of the proposed action. A more detailed description of environmental effects can be found in this EA beginning on page xx.

| NATURAL RESOURCE AND ENVIRONMENTAL CONSEQUENCE | ALT. 1 (Proposed Action) |
|-----------------------------------------------------------------------------------|------------------------------|
| Meets Soil Quality Guidelines | Yes |
| Sediment increases | ?% |
| Increased water yield | ?% |
| Aquatic species biological assessment determination | No Effect, ??? |
| Rare Plants – biological assessment determination | No Effect |
| Secondary road construction (Temporary) | Xx miles |
| Potential risk for agriculture spread and/or introduction within the project area | Low/Moderate/High |
| Pygmy Hippo | No Effect/? |
| Elephant | No Effect |
| CITES Species | No Effect |
| Increased bush meat hunting | yes |
| Impacts or restricts existing subsistence opportunities | No |
| Direct employment | ## |
| Total jobs (direct and indirect/induced) | ## |
| Sawlogs | Volume estimates ie, 25 MMBF |

SUMMARY OF ENVIRONMENTAL EFFECTS

This section describes the environmental impacts of the proposal in relation to whether there may be significant environmental effects. Past, present, and reasonably foreseeable actions, including cumulative effects, may be included in the specialists' reports filed in the Project File (Section G). The following table (Table 3) provides a summary of the

actions considered in the cumulative effects analysis for xxxx Forest Resources Utilization Contract.

Figure 3. Land Ownership in the xxxx Forest Resources Utilization Contract Area(INSERT MAP OF LAND OWNERSHIP)

TABLE 3. ACTIONS CONSIDERED IN THE CUMULATIVE EFFECTS ANALYSIS

| ACTION | PAST | PRESENT | FUTURE |
|----------------------------|---------------------------------|---------|--------|
| Timber harvest concessions | 3,662 acres | | |
| Road construction | 72.1 miles | | |
| Road management | Road maintenance, road closures | X | X |
| Pit Sawing Permits | | X | X |

SOIL RESOURCE

Alternative 1 –Proposed Action

Direct and Indirect Effects

Direct and indirect effects include detrimental soil disturbance caused by the proposed vegetative treatments and temporary road construction. These effects are typically soil displacement, rutting, compaction, and puddling. Design features include measures to reduce the risk of detrimental soil impacts (Appendix B) by limiting the amount of ground the equipment operates on and by imposing restrictions that reduce soil disturbance. The direct and indirect effects of the Alternative 1 would not result in adverse or significant effects on the soil resource because current on-the-ground conditions indicate less than 15 percent soil disturbance in all proposed treatment units.

Cumulative Effects

Within units with previous management activities, cumulative effects include minor increases in the amounts of detrimental soil disturbances. The alternative design features would reduce the effects of proposed management actions on soils and keep the total detrimental soil disturbance to less than xx percent.. By implementing the design features described in Appendix B of this EA, the Soil Quality Guidelines would be met during and after implementation of the Proposed Action. As discussed above, the cumulative effects of the Proposed Action, combined with previous activity and foreseeable future activities within the Project Area, indicate that detrimental soil disturbance would be limited and would be within standards in that regard. Project File Exhibit G-x contains the detailed information supporting this analysis.

Regulatory Framework and Consistency

The soils analysis indicated that Alternative 1 would meet the Soil Quality Standards through implementation of management practices (design features), which include the restoration of landings and heavily used ski trails, if needed, to reduce the total amount of

detrimental soil impacts. All direction for the management of the soil resource would be met during and after implementation of the Proposed Action.

HYDROLOGY

Alternative 1 –Proposed Action

Direct and Indirect Effects

Direct and indirect effects include ground disturbance activities (such as temporary road construction, road maintenance, and culvert replacement) and vegetative changes resulting from the harvest treatments that potentially could result in erosion and sediment sources, increased water yield, and increased nutrient levels.

The alternative design features include measures to reduce the risk of adverse impacts to the water resource (Appendix B). They do so by restricting ground disturbing activities within Streamside Management Zones (SMZs), not allowing mechanized treatment within the Riparian Habitat Conservation Areas (RHCAs), protection of wet areas and the application of road Best Management Practices (BMPs).

The direct and indirect effects of the action alternative would not result in an adverse or significant effect on the hydrology resource. (Project File Exhibit G-x contains more detailed information on this resource.)

Cumulative Effects

The cumulative effects analysis includes consideration of past, present, and reasonably foreseeable actions. Based on baseline conditions, alternative design features that minimize the impacts on the water resource, the above discussion of direct and indirect effects, and the evaluation of reasonably foreseeable actions, there is no evidence that the implementation of this alternative would have a measurable cumulative effect on water quality in streams in the analysis area. Analysis of the existing watershed conditions (based on existing data and field visits) and anticipated affects of the proposed harvest prescriptions lead to this conclusion. Details of this analysis can be found in Project File Exhibit G-x.

Regulatory Framework and Consistency

Through implementation of the alternative design features and project layout, all management actions included in this alternative are consistent with Forest Plan standards and meet *Water Quality Standards*.

WILDLIFE – THREATENED & ENDANGERED SPECIES

Alternative 1 –Proposed Action

Direct and Indirect Effects

Portions of the Project Area are located in areas expected to be suitable wildlife habitat for xx species (name all wildlife species expected in project area.). The direct and indirect effects to these species from timber harvest and road building are expected to be direct loss of habitat by cutting and removing trees used for nesting, and foraging. Since the Code of Forest Practices would be adhered to, an adequate number of nest and foraging areas are expected to remain after harvest is complete.

Key Habitat Areas - Since there are areas already established for the protection of key habitat areas, there would be limited effect on the number and dispersal of key populations of threatened and endangered species.

Mortality Risk - Some displacement of *certain wildlife species* may occur from implementing the Proposed Action. However, since these species are adaptable animals, the expected intensity of human use within the project area and the displacement from habitat would be temporary. The mortality risk for these *wildlife species* from implementing the activities associated with the Proposed Action would not be significantly increased. This is due to the nature of the proposed activity and the likely movement of *wildlife species* to adjacent areas further from human development and activity.

Cumulative Effects

The xxxx Timber Sale Contract area contains/does not contain established human activities, including xxxxxx. Logging and road building has occurred in the area. This proposal would maintain the existing prey base and would not preclude use of habitats in the area. There would be no increase in mortality risk; therefore adverse cumulative effects are not expected.

Regulatory Framework and Consistency

The Biological Assessment indicated that the Proposed Action would be consistent with providing habitat for key wildlife species. The Wildlife Biologist determined that the Proposed Action “may effect – not likely to adversely affect.” the identified wildlife species.

FOREST VEGETATION

Alternative 1-Proposed Action

Direct and Indirect Effects

Forest composition, structure, and age classes

Harvest treatments would reduce competition between trees, increasing availability of light and moisture to remaining trees. This would maintain or improve the vigor and growth of the leave trees. Selective harvest would also maintain the multi-storied, mixed species stands. Proposed vegetation treatments will likely change the age class of the stand, since the largest dominant and codominant trees would be removed in the greatest proportion.

Forest condition – insects, disease, tree damage

Because of the increased tree vigor expected in the mixed species stands, harvest would also increase their ability to withstand future insect or disease influences.

Some root, bole, and crown damage to residual trees may occur because of harvest operations using mechanized equipment.

Cumulative Effects

Considering all past, present, and reasonably foreseeable actions, in combination with the action alternative, the overall cumulative effects on the forest vegetation resource would be positive in the near-term, resulting from reduced competition for limited site resources and improved stand health in the areas of treatment, lasting upward to 20 years or longer. As time goes by, and succession advances, the effects of the treatments will become less noticeable. The proposed treatments would improve the health, resiliency, and sustainability of the treated stands.

Regulatory Framework and Consistency

The project has been designed to be consistent with the Forest Policy goals, objectives and standards. The treatments proposed in the action alternative are consistent with the regulatory framework and management area direction for the areas being treated. All

areas are located within the suitable timber base, where timber harvest may be scheduled and is an appropriate management action.

SOCIAL AND ECONOMIC FACTORS

Alternative 1 –Proposed Action

Direct, Indirect, and Cumulative Effects

Alternative 1 proposes management actions that could include the harvest of up to 3.5 million board feet (MMBF) of forest products. Approximately \$350,000 in timber receipts would be generated from this project, which would be available to fund a portion

Based on information from similar projects in the past, the management actions associated with Alternative 1 would produce approximately 28 direct and 37 indirect job years of potential employment opportunities. This would create an estimated 28 direct jobs in the wood products industry and another 37 jobs spread out over about a 3-5 year period. The economic effects would be primarily in the Upper xxx Valley in xxx County, with minor effects to the adjacent xxxx Counties.

The inclusion of provisions to maintain access for non timber forest products will minimize the effects on the local communities use of the timber sale contract areas during the 3 year contract period. In addition the monies generated by the sale of timber products should serve to benefit the community.

Appendix 3
Proposed FINDING OF NO SIGNIFICANT IMPACT (FONSI)

FONSI – Finding of No Significant Impact

After thorough consideration of the EA, Appendices, the comments received, it has been determined that these actions, individually or cumulatively, will not significantly affect the quality of the human environment. In a local context, the site-specific actions of the proposed action, both short and long term, are not significant. Therefore, an environmental impact assessment and statement is not needed. This determination is based on the following intensity factors:

1. The overall effects of implementing the proposed action will be:
 - Benefiting the Liberian people by providing a new source of revenue to provide for government services;
 - Supporting local communities in providing a source of revenue for their local needs;
 - Providing value-added economic benefits to other local and regional businesses that support the timber industry;
 - Responding to local community input in how the activities should be carried out;

No significant adverse effects to the environment were identified in the Environmental analysis. There is no irreversible commitment of resources in this project. There are no known significant irretrievable commitments of resources such as loss of soil productivity, water quality, wildlife habitat or community opportunities.

2. Public health and safety are not adversely affected by the proposed action.
3. This project will not adversely affect unique characteristics of the geographic area.
4. Based on the involvement of forest resource specialists and members of the public, the effects of the proposed actions on the quality of the human environment to be highly controversial in a scientific context.
5. There are no known effects to the human environment that are highly uncertain or involve unique or unknown risks.
6. These actions do not establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration.
7. These actions do not individually, nor with other activities taken cumulatively within the area affected, reach a level of significance (EA, Cumulative Effects pp. xx,). Where appropriate, design features are proposed which are known to keep effects to vegetation and soils below a threshold level of significance (EA, page xx).

8. Community consultation surveys were completed in month/year for the area proposed for harvest. As a result, provisions were added to the Timber Sale Contract/Forest Management Contract to protect/mitigate community concerns.

9. The effects to to wildlife determined that no federally threatened, or endangered species, or their habitat, will be adversely affected by the actions of this project

10. The actions do not threaten a violation of Federal, State, or local laws imposed for the protection of the environment.