



# **GUIDE FOR MONITORING AND EVALUATION OF FORESTRY OPERATIONS**

**JANUARY 2025**

## **1. INTRODUCTION**

Consolidado MADERACRE (CMRA) currently manages 9 forest concessions, whose combined areas make up a Forest Management Unit (FMU) of 270,0048.9 hectares of tropical natural forests, which are managed within the framework of FSC standards.

In this regard, the company must conduct annual monitoring and evaluation activities of forestry operations carried out by third parties and by itself within the FMU, as well as the forest's response to forest management interventions.

This document provides a guide for planning and implementing monitoring activities focused on forest management implementation.

Monitoring and evaluating forest management also allows for determining the degree of compliance with FSC standards by company employees. The information must be collected in formats developed for each forestry operation, digitized, and processed systematically.

## **2. OBJECTIVES**

### **2.1 Main objective**

- Define guidelines for monitoring and evaluating forestry operations within the concessions comprising the CMRA, as well as the quality of execution attributed to each concession, in order to have information that allows us to make timely changes to the management system based on a continuous feedback process. This process is essential for the ongoing improvement of production quality and efficiency, as well as for mitigating environmental impacts.

### **2.2 Secondary objectives**

- Measure and quantify the degree of compliance with management policies and objectives, establishing the means of verification, verifiable goals, evaluation frequency, and assigned responsibilities.
- Quantify environmental impacts and periodically monitor their evolution.
- Measure the effectiveness of training provided to staff.
- Infer the quality of the company's operations, measuring quality in terms of the lowest negative impact on the ecosystem.
- Infer the quality of the company's management in terms of compliance with FSC standards.

## **3. SCOPE**

This guide covers the forestry operations carried out by MADERACRE in the consolidated forestry concessions. The activities to be evaluated are:

### **Policy monitoring**

- Environmental Management
- Commercial Management
- Certification Management
- Labor Management
- Forest Management
- Social Management
- Occupational Health and Safety Management

### **Monitoring the Quality of Forest Operations and Assessments**

- Permanent sampling plots
- Natural regeneration
- Trees Plot (Diametrical Growth)
- Conservation and boundary areas
- Camps
- Surveillance posts

- Commercial census
- Enrichment

**Environmental Impact Monitoring**

- Felling
- Drag
- Gathering
- Forest roads
- Bridges
- Sewers

**4. METHODOLOGY**

The monitoring and evaluation policy implemented by MADERACRE is based on the importance of timely information on the production and quality of forestry operations. To this end, the company has Coordinators and an Operations Manager who oversee the implementation of operations carried out by the company and its contractors within the concessions. Additionally, a team led by the Monitoring and Evaluation Coordinator ensures that operations are carried out within the framework of the company's instructions and plans, all geared toward compliance with FSC standards. Another team, led by the Head of CoC, is responsible for collecting and managing information on production and timber traceability.

To collect this information, "Field Operations Evaluation Forms" have been developed, one for each activity or operation indicated in the previous point (see annexes). Once the evaluations are completed, the information must be sent to the central office for systematization and analysis.

At all times, coordinators and supervisors must focus their work on compliance with the company's Forest Operations Manual, the Forest Management Practices Regulations, and the standards and manuals defined for each activity within the framework of the PGMF.

## 5. POLICY MONITORING:

### 5.1. Environmental management

| Activity                                                      | Means of verification        | Verifiable goal | Frequency | Responsible                    |
|---------------------------------------------------------------|------------------------------|-----------------|-----------|--------------------------------|
| Declare management of tropical natural forests                | Sworn declaration            | 1               | Biannual  | Regional Manager               |
| Evaluate Climate Risk                                         | Risk report                  | 1               | Annual    | Ecosystem services             |
| Implement Environmental Report                                | Report                       | 1               | Annual    | Occupational health and safety |
| Identify sustainability manager                               | Memorandum                   | 1               | Biannual  | General manager                |
| Establish adequate solid waste management                     | Trainings<br>Attendance list | 1               | Annual    | Occupational health and safety |
| Evaluate the quality of forestry operations                   | Quality report               | 1               | Annual    | Forest Management              |
| Implement non-use of pesticides and fertilizers in operations | Sworn declaration            | 1               | Annual    | Regional Management            |

### 5.2. Commercial Management

| Activity                                     | Means of verification | Verifiable goal | Frequency | Responsible           |
|----------------------------------------------|-----------------------|-----------------|-----------|-----------------------|
| Presentation of the FSC 100% product catalog | Catalog/Magazine      | 1               | Annual    | Commercial management |
| Declare Public Commitment                    | Letter                | 1               | Annual    | Commercial management |
| Sources of supply                            | Report                | 1               | Annual    | Commercial management |

| Activity                                                   | Means of verification | Verifiable goal | Frequency | Responsible           |
|------------------------------------------------------------|-----------------------|-----------------|-----------|-----------------------|
| Implementation and dissemination of responsible purchasing | Protocol              | 1               | Biannual  | Commercial management |
| Development of a wood supplier                             | Map                   | 1               | Annual    | Commercial management |

### 5.3. Certification management

| Activity                                            | Means of verification | Verifiable goal | Frequency | Responsible         |
|-----------------------------------------------------|-----------------------|-----------------|-----------|---------------------|
| Renewal of Adherence to FSC Principles and Criteria | Letter                | 1               | Annual    | Regional Management |
| Maintain the FSC Audit certificate                  | Certification report  | 1               | Annual    | Forest Management   |

### 5.4. Labor management

| Activity                                                                                          | Means of verification | Verifiable goal | Frequency | Responsible    |
|---------------------------------------------------------------------------------------------------|-----------------------|-----------------|-----------|----------------|
| Implementation or formation of an ethics and sexual harassment prevention committee               | Committee             | 1               | Biannual  | Administration |
| Dissemination of institutional communication                                                      | Training              | 1               | Annual    | Administration |
| Dissemination of Ethics, Anti-Corruption, Anti-Terrorism and Money Laundering Prevention Policies | Training              | 1               | Annual    | Administration |
| Dissemination of labor equality and anti-discrimination policies                                  | Training              | 1               | Annual    | Administration |

| Activity                                                                       | Means of verification | Verifiable goal | Frequency | Responsible    |
|--------------------------------------------------------------------------------|-----------------------|-----------------|-----------|----------------|
| Dissemination of Privacy and Labor Confidentiality Policy                      | Training              | 1               | Annual    | Administration |
| Dissemination of Policy Promotions and Transfers                               | Training              | 1               | Annual    | Administration |
| Dissemination of recruitment, selection and incorporation policy and procedure | Training              | 1               | Annual    | Administration |
| Dissemination of employee rights and ILO conventions                           | Training              | 1               | Annual    | Administration |
| Dissemination of Prevention, Investigation and Sanction                        | Procedure             | 1               | Annual    | Administration |

#### 5.4. Forest management

| Activity                                                                                         | Means of verification                                                       | Verifiable goal | Frequency     | Responsible       |
|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------|---------------|-------------------|
| Evaluate the state of natural regeneration of forest species of commercial interest              | Technical reports on regeneration monitoring.<br>Georeferenced photographs. | 1               | Biannual      | Forest Management |
| Periodically assess high conservation value forests                                              | BAVC monitoring reports.                                                    | 1               | Max 5 years** | Forest Management |
| Establish an adequate custody and surveillance system for the accesses and boundaries of the UMF | Information                                                                 | 1               | Annual        | Forest Management |

| Activity                                                                                                               | Means of verification | Verifiable goal | Frequency | Responsible       |
|------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------|-----------|-------------------|
| Establish proper monitoring of forestry operations                                                                     | Evaluation report     | 1               | Annual    | Forest Management |
| Dissemination of documents on adjacency with adjacent areas                                                            | Deeds of boundary     | 1               | Annual    | Forest Management |
| Dissemination of Operations Regulations                                                                                | Training              | 1               | Annual    | Forest Management |
| Dissemination of the manual on the Construction, Use and Closure of Camps                                              | Training              | 1               | Annual    | Forest Management |
| Dissemination of the Satellite Monitoring Manual                                                                       | Training              | 1               | Annual    | Forest Management |
| Dissemination of Biodiversity Monitoring                                                                               | Training              | 1               | Annual    | Forest Management |
| Dissemination of Chain of Custody Procedures                                                                           | Training              | 1               | Annual    | Forest Management |
| Dissemination of Direct Georeferencing Census                                                                          | Training              | 1               | Annual    | Forest Management |
| Measuring diametrical growth with tree plot                                                                            | Evaluation report     | 1               | Biannual  | Forest Management |
| Periodically evaluate wildlife within the concession                                                                   | Evaluation report     | 1               | Annual    | Forest Management |
| Record and measure changes in forest structure and composition with and without interventions due to forest harvesting | Evaluation report     | 1               | Biannual  | Forest Management |

\*\* Max 5 years: The adjustment of the variables will be made based on the results of the monitoring, and should not exceed a period of more than 5 years for its review, and should occur every time an event that significantly impacts the system is evident (in a period of less than 5 years).

## 5.5. Occupational health and safety management



| Activity                                                    | Means of verification                                                                                                              | Verifiable goal | Frequency | Responsible                    |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------|--------------------------------|
| Fire Management Dissemination                               | -Attendance lists.<br>-Material delivered (booklets, presentations).<br>-Photographic evidence                                     | 1               | Annual    | Occupational health and safety |
| Dissemination of the use and handling of fire extinguishers | -Training records.<br>-Records of drills with the use of fire extinguishers.<br>-Attendance lists.<br>-Photographs of the practice | 1               | Annual    | Occupational health and safety |
| Forest fire dissemination                                   | -Dissemination minutes<br>-Educational material delivered.<br>-Photographs                                                         | 1               | Annual    | Occupational health and safety |
| Implementation of Fire Brigades                             | -Minutes of formation of brigades.<br>-List of brigade members.<br>-Records of specialized training.                               | 1               | Annual    | Occupational health and safety |
| First Aid Dissemination                                     | -Training minutes.<br>-Attendance lists.<br>-Dissemination material.<br>-Photographic evidence.                                    | 1               | Annual    | Occupational health and safety |
| Implementation of IPERC                                     | -Updated and approved IPERC matrix.<br>-Evidence of implementation of controls (checklists, inspections).                          | 1               | Annual    | Occupational health and safety |
| Implementation of a contingency or emergency plan           | -Minutes of dissemination to staff.<br>-Photographic evidence.                                                                     | 1               | Annual    | Occupational health and safety |

| Activity                                                           | Means of verification                                                                                                                                         | Verifiable goal | Frequency | Responsible                    |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------|--------------------------------|
| Implementation and dissemination of the Training Plan              | -Training schedule executed.<br>-Attendance lists.                                                                                                            | 1               | Annual    | Occupational health and safety |
| Dissemination of Internal Regulations on Safety and Health at Work | -Copy of the regulations delivered.<br>-Dissemination minutes.<br>-Records of receipt signatures.                                                             | 1               | Annual    | Occupational health and safety |
| Evaluate accident and incident statistics                          | -Incident and accident database.<br>-Monthly/annual statistical reports.<br>-Minutes of the SST Committee reviewing the reports.<br>-Trend charts.<br>-Report | 1               | Annual    | Occupational health and safety |
| Dissemination of Occupational Health and Safety Policy             | -Policy document signed by management.<br>-Induction and training records.<br>-Dissemination minutes.<br>-Photographs                                         | 1               | Annual    | Occupational health and safety |

## 5.6. Social Management

| Activity                                                                                     | Means of verification                                                   | Verifiable goal | Frequency | Responsible           |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------|-----------|-----------------------|
| Implement and disseminate the Free, Prior and Informed Consent Protocol                      | -Workshop minutes.<br>-Attendance records.<br>-Photographs.             | 1               | Annual    | Social responsibility |
| Dissemination of Citizen Participation Workshop                                              | -Minutes of meetings.<br>-Attendance lists.<br>-Dissemination material. | 2               | Annual    | Social responsibility |
| Dissemination of the Conflict Resolution Protocol                                            | -Dissemination minutes.<br>Photographs.                                 | 1               | Annual    | Social responsibility |
| Implementation of the Contingency Plan for the Protection of Indigenous Peoples in Isolation | -Annual compliance report.<br>-Training records.                        | 1               | Biannual  | Social responsibility |
| Implementation of the Social Responsibility Plan                                             | -Activity reports                                                       | 1               | Biannual  | Social responsibility |
| Dissemination of Policy to Respect the Rights of Amazonian Indigenous Peoples                | -Web page                                                               | 1               | Annual    | Social responsibility |
| Implementation of social environmental monitoring                                            | -Monitoring reports.<br>-Databases.<br>-Photographic records.           | 1               | Annual    | Social responsibility |
| Implementation of the Forest Management Risk Assessment                                      | -Risk assessment report.<br>-Updated risk matrix.                       | 2               | Biannual  | Social responsibility |

| Activity                                                         | Means of verification                                                       | Verifiable goal | Frequency | Responsible           |
|------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------|-----------|-----------------------|
| Community Relations Advisory Committee Workshop<br>Dissemination | -Minutes of the committee.<br>-Attendance lists.<br>-Photographic evidence. | 2               | Annual    | Social responsibility |

## 6. Monitoring Management Plan Objectives:

| Goals                           | Activities                                                                                                             | Indicator / Means of Verification * | Verifiable goal | Frequency      | Responsible                           |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------------|----------------|---------------------------------------|
| Integrated ecosystem management | Evaluate the state of Natural Regeneration of forest species of commercial interest.                                   | Evaluation report                   | 1               | Annual         | Evaluation and Monitoring Coordinator |
|                                 | Measure the growth of each forest species                                                                              | Evaluation report                   | 1               | Biannual       | Evaluation and Monitoring Coordinator |
|                                 | Establish appropriate silvicultural variables for each species and based on the Cutting Cycle (CC) defined for the UM. | Updated silvicultural system        | 1               | Max 5 years ** | Evaluation and Monitoring Coordinator |
|                                 | Define the need and feasibility of implementing silvicultural treatments by species.                                   | Updated silvicultural system        | 1               | Max 5 years ** | Evaluation and Monitoring Coordinator |
|                                 | Implement a reduced impact harvesting (RIH) system                                                                     | Evaluation report                   | 1               | Annual         | Evaluation and Monitoring Coordinator |

| Goals | Activities                                                                                                      | Indicator / Means of Verification * | Verifiable goal | Frequency    | Responsible                           |
|-------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------------|--------------|---------------------------------------|
|       | Establish an appropriate system of control and surveillance of access and limits to the concession.             | Number of invasion events           | 0               | Annual       | Evaluation and Monitoring Coordinator |
|       | Prohibit hunting of wildlife species within the concession.                                                     | Hunted Animals                      | 0               | Annual       | Evaluation and Monitoring Coordinator |
|       | Periodically assess wildlife important for monitoring by recording sightings                                    | Evaluation report                   | 1               | Annual       | Evaluation and Monitoring Coordinator |
|       | Evaluate the status of wildlife in general, as well as the evolution of its population indicators over time     | Evaluation report                   | 1               | Quinquennial | Evaluation and Monitoring Coordinator |
|       | Identify important sites for wildlife during forest census work                                                 | Site map                            | 1               | Annual       | Evaluation and Monitoring Coordinator |
|       | Exclude from exploitation areas that contain sites of importance for wildlife                                   | Number of trees felled in AC        | 0               | Annual       | Evaluation and Monitoring Coordinator |
|       | Exclude conservation areas from logging. Ensure that the area is used in a manner compatible with conservation. | Number of trees felled in AC        | 0               | Annual       | Evaluation and Monitoring Coordinator |
|       | Delimit and mark conservation areas with the use of pedestrian paths and information signs                      | AC marked                           | 2               | Annual       | Evaluation and Monitoring Coordinator |

| Goals | Activities                                                                                                                             | Indicator / Means of Verification *                        | Verifiable goal | Frequency | Responsible                           |
|-------|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-----------------|-----------|---------------------------------------|
|       | Establish fiscal strips in rivers and open streams of up to 25 meters on each side                                                     | Evaluation report                                          | Annual          | Annual    | Evaluation and Monitoring Coordinator |
|       | Implement and disseminate the Anthropological Contingency Plan in case of sightings or records of evidence of the presence of PIACI.   | Number of trainings                                        | 2               | Annual    | Evaluation and Monitoring Coordinator |
|       | Conduct patrols from river surveillance posts to prevent third parties from entering the FMU, primarily in the Tahuamanu River sector. | Number of patrols                                          | 4               | Biannual  | Evaluation and Monitoring Coordinator |
|       | Maintain the taricaya population management program in the Tahuamanu River                                                             | Number of Taricayas released into their natural habitat*** | 767             | Annual    | Evaluation and Monitoring Coordinator |
|       |                                                                                                                                        | Number of eggs hatched***                                  | 769             | Annual    | Evaluation and Monitoring Coordinator |
|       |                                                                                                                                        | Number of eggs collected***                                | 780             | Annual    | Evaluation and Monitoring Coordinator |
|       | Exclude conservation areas from logging. Ensure that the area is used in a manner compatible with conservation.                        | Number of trees felled in AC                               | 0               | Annual    | Evaluation and Monitoring Coordinator |

| Goals                                | Activities                                                                                                  | Indicator / Means of Verification * | Verifiable goal | Frequency    | Responsible                           |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------------|--------------|---------------------------------------|
| Management for conservation purposes | Prohibit hunting of wildlife species within the concession                                                  | Hunted Animals                      | 0               | Annual       | Evaluation and Monitoring Coordinator |
|                                      | Delimit and mark conservation areas with the use of pedestrian paths and information signs                  | AC marked                           | 2               | Annual       | Evaluation and Monitoring Coordinator |
|                                      | Establish an adequate surveillance system for access to and boundaries of conservation areas                | Number of invasion events           | 0               | Annual       | Evaluation and Monitoring Coordinator |
| Wildlife management                  | Prohibit hunting of wildlife species within the concession.                                                 | Hunted Animals                      | 0               | Annual       | Evaluation and Monitoring Coordinator |
|                                      | Periodically assess wildlife important for monitoring by recording sightings                                | Evaluation report                   | 1               | Annual       | Evaluation and Monitoring Coordinator |
|                                      | Evaluate the status of wildlife in general, as well as the evolution of its population indicators over time | Evaluation report                   | 1               | Quinquennial | Evaluation and Monitoring Coordinator |
|                                      | Identify important sites for wildlife during forest census work                                             | Site map                            | 1               | Annual       | Evaluation and Monitoring Coordinator |
|                                      | Exclude from exploitation areas that contain sites of importance for wildlife                               | Number of trees felled in AC        | 0               | Annual       | Evaluation and Monitoring Coordinator |
|                                      | Establish an appropriate system of control and surveillance of access points                                | Number of invasion events           | 0               | Annual       | Evaluation and Monitoring Coordinator |

| Goals                                                                                                                                                                                                                                                                                                                                                                                                                             | Activities                                            | Indicator / Means of Verification * | Verifiable goal | Frequency | Responsible |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------|-----------------|-----------|-------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                   | and boundaries to the concession to prevent poaching. |                                     |                 |           |             |
| <p>In some cases they are considered Indicators and in others Means of Verification</p> <p>**Maximum 5 years: The adjustment of the variables and silvicultural treatments will be made based on the results of the monitoring, and should not exceed a period of more than 5 years for its review, and should occur every time an event that significantly impacts the system is evident (in a period of less than 5 years).</p> |                                                       |                                     |                 |           |             |

| Goals              |                           | Indicator results                                                                                                    | Verifiable goal                                                               | Frequency | Responsible             |
|--------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------|-------------------------|
| Ecosystem services | Conservation of diversity | Number of species recorded in the fauna studies (Wealth of species).                                                 | Record more than 40 species in the annual evaluations on PCs intervened       | Annual    | Ecosystem services area |
|                    |                           | Number of key species whose presence allows to infer the state of ecosystem health (Species priority for monitoring) | Do not register less than 16 species priority in the evaluations five-yearly. | Annual    | Ecosystem services area |
|                    |                           | Number of hunting events recorded                                                                                    | Zero poaching events.                                                         | Annual    | Ecosystem services area |



| Goals |  | Indicator results                                                 | Verifiable goal                                                                                                          | Frequency | Responsible             |
|-------|--|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------|
|       |  | annually.                                                         |                                                                                                                          |           |                         |
|       |  | Number of illegal logging events registered annually.             | Zero illegal logging incidents                                                                                           | Annual    | Ecosystem services area |
|       |  | Number of fire events forest fires that occur annually            | Zero forest fire events                                                                                                  | Annual    | Ecosystem services area |
|       |  | % of area affected by fires forestry                              | Zero hectares affected by forest fires                                                                                   | Annual    | Ecosystem services area |
|       |  | Hectares protected from hunting poaching and illegal logging.     | 269,238.507 hectares of forests free of illegal logging and poaching. (27,518.6 ha of AC + 241,719.91 ha of BP with AIR) | Annual    | Ecosystem services area |
|       |  | Natural forest area that maintains its conservation status (Has). | 27,518.6 ha of Conservation Areas and frank fiscal that remain in the UMF.                                               | Annual    | Ecosystem services area |
|       |  | Restoration time of the plant cover on a PC intervened.           | 50% of the degraded area with coverage forestry after a year of its intervention.                                        | Annual    | Ecosystem services area |

| Goals |                                  | Indicator results                                         | Verifiable goal                                                                       | Frequency | Responsible             |
|-------|----------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------|-----------|-------------------------|
|       |                                  | % of area degraded by the execution of AIR operations     | The affected area annually should not exceed 1% of the total surface area of the UMF. | Annual    | Ecosystem services area |
|       |                                  |                                                           |                                                                                       |           |                         |
|       | Carbon sequestration and storage | % of area degraded by the execution of AIR operations     | The affected area annually should not exceed 1% of the total surface area of the UMF. | Annual    | Ecosystem services area |
|       |                                  | Amount of carbon lost by the execution of AIR operations. | Do not exceed the ratio of 1% of annual carbon loss.                                  | Annual    | Ecosystem services area |
|       |                                  | Restoration time of the plant cover on a PC intervened.   | 50% of the degraded area with coverage forestry after a year of its intervention      | Annual    | Ecosystem services area |
|       |                                  | Number of illegal logging events registered annually.     | Zero illegal logging incidents                                                        | Annual    | Ecosystem services area |
|       |                                  | Hectares protected from logging illegal.                  | 269,238.507 hectares of forests free of illegal logging and poaching. (27,518.6       |           |                         |

| Goals |  | Indicator results                                                            | Verifiable goal                                           | Frequency | Responsible                |
|-------|--|------------------------------------------------------------------------------|-----------------------------------------------------------|-----------|----------------------------|
|       |  |                                                                              | ha of AC + 241,719.91<br>ha of BP with<br>AIR)            |           |                            |
|       |  | Number of fire events<br>forest fires that occur<br>annually                 | Zero forest fire events                                   | Annual    | Ecosystem services<br>area |
|       |  | % of area affected by<br>fires<br>forestry                                   | Zero hectares affected<br>by<br>forest fires              | Annual    | Ecosystem services<br>area |
|       |  | Natural forest area<br>that<br>maintains its<br>conservation status<br>(Has) | 27,518.6 ha of<br>Conservation Areas<br>remain at the UMF | Annual    | Ecosystem services<br>area |

## **7. MONITORING OBJECTS AND METHODOLOGY OF THE QUALITY OF FORESTRY OPERATIONS AND EVALUATIONS**

### **7.1 PERMANENT MONITORING PLOTS (PPM)**

The person responsible for conducting field evaluations will assess the status of the PPMs and must complete the evaluation forms for said operation (See Annex 1.1 and 1.2). To do so, the following points will be taken into account:

#### **7.1.1 Equipment and Materials**

The following equipment and materials will be required for data collection:

- GPS Navigator
- Compass
- 3m winch
- Tape measure 10m
- Tape measure 50m
- Field notebook
- PPM Evaluation Form
- Pencil
- Duracell AA batteries

#### **7.1.2 Qualitative evaluation**

- a) Verify the demarcation, orientation, and horizontality of the use of water strips at the boundaries of the subplots.
- b) Status and marking of all vertices of the sub-plots.
- c) The PPM must have a buffer area to avoid loss of information due to the felling and/or cutting of individuals within the plot.
- d) Marking and coding of trees at 1.30 above ground level (DBH) and with the individual's consecutive numbering.
- e) Location of trees in the sub-plots referenced by the X and Y axes.

#### **5.1.3 Similarity evaluation**

- a) Verify the presence of the tree plaque and the corresponding code, as well as the correlation of the individuals evaluated.
- b) Identify the categorization of the individual's status at the time of the study (alive, dead, recruited, exploited, not found).

- c) Re-evaluate the data collection of dasometric parameters, as it is a critical component of the assessment. The data should be compared with the data collected by the survey teams to calculate the permissible margin of error and take corrective measures..
- **Circumference measurement:** measurement of the circumference at a height of 1.3 m (CAP) in relation to ground level, however, if the individual has fins or protuberance, the measurement will be taken 30 cm above, if this persists, continue the ascent until the measurement is not affected.
  - **Commercial and total height:** the visual estimation of the commercial height must be carried out by positioning oneself in a place that is as close as possible to the base of the tree and where the start of the crown or main branching can also be observed, moving away from the base of the tree between 10 and 20 m (to avoid estimation errors, the distance from the tree should be equivalent to its height, if possible) in the direction that is most relevant to the estimation, considering that in the case that branches of small diameters are found and it is seen that the trunk continues, the measurement will be carried out in the highest part where the true primary or main branching occurs (where the trunk of the tree is interrupted); the estimation of the total height is surveyed up to the upper culmination of the crown, following the same practical principles described previously.
- d) Diameter measurements for saplings will be carried out using the same methodology as for stems. However, if the measurement coincides with the presence of branches typical of the trees, this measurement will be taken below the first branch. Diameter measurements for saplings will not be taken.
- e) The height for the latizales and sapling size classes will be measured at the central apex of the plant.
- f) **Stem quality:** Stem quality grading is based on the individual's phenotype and phytosanitary status. If Quality B is reported, an observation regarding the findings, such as hollow stem, crooked stem, etc., should be considered.
- g) **Exhibition of the cup:** It corresponds to the percentage of natural light that the canopy receives depending on the stratum in which it is located and the size of the neighboring individuals present.
- h) **Cup shape:** It corresponds to the projection and volume that it provides in its development stage to reach, in general, higher strata.
- i) **Liana infestation:** It corresponds to the degree of presence, and therefore affection by the lianas both in the stem and in the crown.

To select the individuals to be evaluated, a significant sample of 10% of the total sub-plots corresponding to a PPM will be extracted.

#### **7.1.4 Processing information from forms**

The processing of information from the qualitative and similarity assessment product in the quality of monitoring PPM assessments will be represented in percentages with respect to the effectiveness of the work performed:

Qualitative evaluations are the result of the visual inspection carried out by the evaluator, in which four ratings have been generated: Good (100%), when the operations carried out have fully complied with the standards described previously, Regular (66%), the existence of some operations that have not fully complied with the quality standards, Bad (33%), the total non-compliance with the standards but there is evidence that there was an effort to carry out the work, and Non-existent (0%), when there is no evidence of the work carried out.

The ratings include the overall monitoring of the activity corresponding to the evaluated PPM sub-plots, which is based on the evaluator's criteria.

**Chart1. Exemplification of data processing in the qualitative assessment of PPM subplot monitoring quality.**

| Purpose of the evaluation            | Quality |         |      | Observations         | Processing quality (%) |
|--------------------------------------|---------|---------|------|----------------------|------------------------|
|                                      | Bad     | Regular | Well |                      |                        |
| Demarcation of sub-plots (shafts)    |         |         |      | There is no evidence | 0                      |
| Demarcation of sub-plots (latizales) |         | X       |      |                      | 66                     |
| Demarcation of sub-plots (saplings)  |         |         | X    |                      | 100                    |
| State and plating of the vertices    |         |         | X    |                      | 100                    |
| Buffer area                          |         | X       |      |                      | 66                     |
| Coding of individuals                | X       |         |      |                      | 33                     |
| Location of trees in sub-plots       |         |         | X    |                      | 100                    |
|                                      |         |         |      |                      | 66.43                  |

The score for the quality of the evaluation of a sub-plot in a PPM in the qualitative format is 66.43%.

Similarity assessments correspond to the re-evaluation of dasometric parameters in conjunction with assessments of the forest's ecological functions. Percentage values will be generated for each assessment, representing the good or bad practices implemented.

- The individual's code and species must be the same as those reported by the assessment team, with a score of 20% if the code and species match, and 0% if they do not.
- The categorization of individuals must be the same as that reported by the evaluation team, with a score of 20% if the code matches, and 0% if it does not.
- The permissible error ranges based on the Timber Forest Resources Evaluation Protocol for circumference measurement are  $\pm 7\%$ , with the rating being 20% if the values are within the permissible range, and 0% if not.

- d) The permissible error ranges based on the Timber Forest Resources Evaluation Protocol for estimating commercial and total height are  $\pm 25\%$ , with the rating being 5% for each if the values are within the permissible range, and 0% if not.
- e) Stem quality must be characterized based on the phenotype and phytosanitary status of the individual, with a score of 5% if the characterization matches, and 0% if not.
- f) The observations are related to the Quality of the Stem and the particular situations in which the individual is found, with a score of 5% if the description matches, and 0% if it does not.
- g) The canopy's exposure is related to the amount of light it receives for its development, with a rating of 10% if the description matches, and 0% if it does not.
- h) The cup shape is related to its projection and volume, with a rating of 5% if the description matches, and 0% if it does not.
- i) The degree of infestation of vines in their host individuals must be equal to that reported by the evaluation teams, with a score of 5% if it matches, and 0% if it does not.
- j) The latizales are only evaluated for species identification, diameter, and height. Since they are not abundant, they can be effectively tracked within the sampled subplots. The score is 50% if the species matches, and 0% if not; 40% if the diameter matches, and 0% if not; and 10% if the height matches, and 0% if not.
- k) Saplings are only evaluated for species and height identification, and since they are very abundant, this leads to errors in individual identification. Therefore, height will not be taken into account when evaluating quality. 100% is given if the identification matches, and 0% if it does not.

**Chart2. An example of data processing in the assessment of the monitoring quality of a PPM subplot in terms of similarity.**

| Quality of a Ficus cap plot in terms of similarity. |    |        |    |                  |     |        |        |                          |    |        |        |                              |    |        |        |              |    |               |    |                |    |           |    |                   |  |       |
|-----------------------------------------------------|----|--------|----|------------------|-----|--------|--------|--------------------------|----|--------|--------|------------------------------|----|--------|--------|--------------|----|---------------|----|----------------|----|-----------|----|-------------------|--|-------|
| Code                                                |    | Categ. |    | Cap Reading (cm) |     |        |        | Tree trunk height (m)    |    |        |        | Total height of the tree (m) |    |        |        | Stem quality |    | Observatio n. |    | Cup exhibition |    | Cup shape |    | Liana infestation |  |       |
| EC                                                  | EV | EC     | EV | EC               | EV  | EP (-) | EP (+) | EC                       | EV | EP (-) | EP (+) | EC                           | EV | EP (-) | EP (+) | EC           | EV | EC            | EV | EC             | EV | EC        | EV |                   |  |       |
| 1                                                   | 1  | 1      | 1  | 254              | 257 | 236    | 272    | 17                       | 23 | 13     | 21     | 27                           | 29 | 20     | 34     | TO           | TO |               |    | 1              | 1  | 1         | 1  |                   |  |       |
| 4                                                   | 4  | 1      | 1  | 39               | 38  | 36     | 42     | 9                        | 10 | 7      | 11     | 16                           | 17 | 12     | 20     | TO           | B  |               | HF | 2              | 1  | 2         | 2  |                   |  |       |
| 5                                                   | 6  | 1      | 3  | 111              | 118 | 103    | 119    | 13                       | 12 | 10     | 16     | 18                           | 17 | 14     | 23     | B            | B  | FT            | FT | 2              | 2  | 1         | 1  |                   |  |       |
| 19                                                  | 19 | 1      | 1  | 80               | 100 | 74     | 86     | 12                       | 12 | 9      | 15     | 19                           | 19 | 14     | 24     | TO           | TO |               |    | 2              | 2  | 2         | 1  |                   |  |       |
| Code                                                |    | Categ. |    | Cap Reading (cm) |     |        |        | Height of the tree trunk |    |        |        | Total height of the tree     |    |        |        | Stem quality |    | Observations  |    | Cup exhibition |    | Cup shape |    | Liana infestation |  | Total |
| 20                                                  |    | 20     |    | 20               |     |        |        | 0                        |    |        |        | 5                            |    |        |        | 5            |    | 5             |    | 10             |    | 5         |    | 5                 |  | 95    |
| 20                                                  |    | 20     |    | 20               |     |        |        | 5                        |    |        |        | 5                            |    |        |        | 0            |    | 0             |    | 0              |    | 5         |    | 5                 |  | 80    |
| 0                                                   |    | 0      |    | 20               |     |        |        | 5                        |    |        |        | 5                            |    |        |        | 5            |    | 5             |    | 10             |    | 5         |    | 0                 |  | 55    |

|    |    |   |   |   |   |   |    |   |   |      |
|----|----|---|---|---|---|---|----|---|---|------|
| 20 | 20 | 0 | 5 | 5 | 5 | 5 | 10 | 0 | 5 | 75   |
|    |    |   |   |   |   |   |    |   |   | 76.3 |

CE: Census; EV: Quality Assessment; Categ.: Category; Cap: Circumference at chest height; EP: Permissible error

Within the permissible range; Outside the permissible range

The score for the quality of the evaluation of a sub-parcel in a PPM in the similarity format is 76.3%.

For both evaluations (qualitative and similarity) percentage values will be assigned, which correspond as follows: Qualitative evaluation 15% and Similarity evaluation 85%, this is represented by the importance that each of them has in the PPM evaluations.

**Chart3. Example of the processing of quality and similarity assessment results in a PPM subplot.**

| Concept                | Evaluation weight (%) | Resulting value (%) | Total (%) |
|------------------------|-----------------------|---------------------|-----------|
| Qualitative evaluation | 15                    | 66.43               | 9.96      |
| Similarity assessment  | 85                    | 76.3                | 64.86     |
|                        |                       |                     | 74.82     |

The final result is 74.82%, corresponding to the quality monitoring of the assessment of a PPM subplot. Repeat the procedure for each of the sampled subplots and calculate their average. If there is more than one PPM assessment in the year, calculate the averages of the quality monitoring of all of them to obtain a final result for the activities.

The frequency of PPM assessments is subject to the installation or reassessment schedule, and is conducted annually around the time forestry operations cease. The details of the assessments at the CMRA are as follows:

**Chart4Summary of the installation and re-evaluation of PPMs at the CMRA.**

| PPM                | 2011               | 2012                                                                                                                                                                                                                                                    | 2015                  | 2017                         | 2018          | 2019        | 2021          | 2022          | 2023          | 2024          |
|--------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------|---------------|-------------|---------------|---------------|---------------|---------------|
| TIPO DE EVALUACION |                    |                                                                                                                                                                                                                                                         |                       |                              |               |             |               |               |               |               |
| 1                  | Instalación        |                                                                                                                                                                                                                                                         |                       |                              |               |             |               |               |               |               |
| 2                  | Instalación        |                                                                                                                                                                                                                                                         |                       |                              |               |             |               |               |               |               |
| 3                  | Instalación        | <b>NATURAL REGENERATION (RN)</b>                                                                                                                                                                                                                        |                       |                              |               |             |               |               |               |               |
| 4                  | Instalación        | The person responsible for carrying out field evaluations will assess the status of the evaluation strips, and must therefore complete the evaluation forms for said strips (See 1 and 2.2). To do so, the following points will be taken into account: |                       |                              |               |             |               |               |               |               |
| 5                  | Instalación        | Re-evaluación                                                                                                                                                                                                                                           |                       |                              |               |             |               |               |               |               |
| 6                  | Instalación        | Re-evaluación                                                                                                                                                                                                                                           |                       |                              |               |             |               |               |               |               |
| 7                  | 5.2.1 Equipment    | Instalación                                                                                                                                                                                                                                             | Materials             | Re-evaluación                |               |             |               | Re-evaluación |               |               |
| 8                  | The following      | Instalación                                                                                                                                                                                                                                             | and materials will be | required for data collection | Re-evaluación |             |               |               |               |               |
| 9                  |                    | Instalación                                                                                                                                                                                                                                             | Re-evaluación         |                              | Re-evaluación |             |               |               | Re-evaluación |               |
| 10                 | ➤ GPS Na           | Instalación                                                                                                                                                                                                                                             | Re-evaluación         |                              | Re-evaluación |             |               |               | Re-evaluación |               |
| 11                 | ➤ Compass          |                                                                                                                                                                                                                                                         |                       | Instalación                  |               |             | Re-evaluación |               |               | Re-evaluación |
| 12                 | ➤ 3m wind          |                                                                                                                                                                                                                                                         |                       | Instalación                  |               |             | Re-evaluación |               |               | Re-evaluación |
| 13                 | ➤ Tape measure 10m |                                                                                                                                                                                                                                                         |                       |                              |               | Instalación |               |               | Re-evaluación |               |
| 14                 |                    |                                                                                                                                                                                                                                                         |                       |                              |               | Instalación |               |               | Re-evaluación |               |
| 15                 |                    |                                                                                                                                                                                                                                                         |                       |                              |               |             |               |               |               | Instalación   |
| 16                 |                    |                                                                                                                                                                                                                                                         |                       |                              |               |             |               |               |               | Instalación   |



- Field notebook
- RN Evaluation Form
- Pencil
- Duracell AA batteries

### 5.2.2 Qualitative evaluation

- a) Check the evaluation widths for each of the size classes.
- b) Evaluate the correct markings and their descriptions on the markers that demarcate the start and end of the evaluation strips using stakes made of hard understory species, ensuring that the markings have a minimum durability of two years.
- c) Characterization of specific areas within the evaluation zones with indications of the occurrence of any of the harvesting activities carried out in previous years (logging, stockpile yards, roads, etc.).

### 5.2.3 Similarity evaluation

- a) Verify the correct identification of the censused trees with personnel specialized in the identification of tropical forest timber species.
- b) Re-evaluate the data collection of dasometric parameters, as it is a critical component of the assessment. The data should be compared with those collected by the crews to calculate the permissible margin of error and take corrective measures. Reported for the stems class.
  - **Circumference measurement:** measurement of the circumference at a height of 1.3 m (CAP) in relation to ground level, however, if the individual has fins or protuberance, the measurement will be taken 30 cm above, if this persists, continue the ascent until the measurement is not affected.
  - **Commercial and total height:** the visual estimation of the commercial height must be carried out by positioning oneself in a place that is as close as possible to the base of the tree and where the start of the crown or main branching can also be observed, moving away from the base of the tree between 10 and 20 m (to avoid estimation errors, the distance from the tree should be equivalent to its height, if possible) in the direction that is most relevant to the estimation, considering that in the case that branches of small diameters are found and it is seen that the trunk continues, the measurement will be carried out in the highest part where the true primary or main branching occurs (where the trunk of the tree is interrupted); the estimation of the total height is surveyed up to the upper culmination of the crown, following the same practical principles described previously.
- c) Diameter measurements for saplings will be carried out using the same methodology as for stems. However, if the measurement coincides with the presence of branches typical of the trees, this measurement will be taken below the first branch. Diameter measurements for saplings will not be taken.

- d) The height for the latizales and sapling size classes will be measured at the central apex of the plant.
- e) **Stem quality:** The stem quality rating is based on the individual's phenotype and phytosanitary status. If Quality B is reported, an observation regarding the findings should be considered, such as a hollow stem, a crooked stem, etc. Reported for the stem class.
- f) **Exhibition of the cup:** It corresponds to the percentage of natural light that the canopy receives depending on the stratum in which it is located and the size of the neighboring individuals present. Reported for the fustales class.
- g) **Cup shape:** corresponds to the projection and volume that it provides in its developmental stage to generally reach higher strata. Reported for the stem class.
- h) **Liana infestation:** corresponds to the degree of presence, and therefore affection by the lianas both in the stem and in the crown. Reported for the stem class.

To select the individuals to be evaluated, a significant sample of 10% of the total number of bands corresponding to the RN evaluation will be extracted.

#### 5.2.4 Processing information from forms

The processing of information resulting from the qualitative and similarity assessment of the quality of monitoring RN evaluations will be represented in percentages with respect to the effectiveness of the work performed:

Qualitative evaluations are the result of the visual inspection carried out by the evaluator, in which four ratings have been generated: Good (100%), when the operations carried out have fully complied with the standards described previously, Regular (66%), the existence of some operations that have not fully complied with the quality standards, Bad (33%), the total non-compliance with the standards but there is evidence that there was an effort to carry out the work, and Non-existent (0%), when there is no evidence of the work carried out.

The ratings include general monitoring of the activity corresponding to the evaluated RN bands, which is based on the evaluator's criteria.

**Chart5. Exemplification of data processing in the qualitative assessment of the quality of RN belt monitoring.**

| Purpose of the evaluation             | Quality |         |      | Observations | Processing quality (%) |
|---------------------------------------|---------|---------|------|--------------|------------------------|
|                                       | Bad     | Regular | Well |              |                        |
| Limitation of the belt (shafts)       |         | X       |      |              | 66                     |
| Limitation of the belt (latizales)    |         |         | X    |              | 100                    |
| Limitation of the strip (saplings)    |         |         | X    |              | 100                    |
| State of the start and end strip tape |         |         | X    |              | 100                    |

|                              |  |  |  |                          |      |
|------------------------------|--|--|--|--------------------------|------|
| Characterization of the area |  |  |  | It was not characterized | 0    |
|                              |  |  |  |                          | 73.2 |

The quality rating for one of the RN belts in the qualitative format is 73.2%.

Similarity assessments correspond to the re-evaluation of dasometric parameters in conjunction with assessments of the forest's ecological functions. Percentage values will be generated for each assessment, representing the good or bad practices implemented.

- The species must be the same as those reported by the assessment team, with a score of 30% if the species matches, and 0% if not.
- The permissible error ranges based on the Timber Forest Resources Evaluation Protocol for circumference measurement are  $\pm 7\%$ , with the rating being 30% if the values are within the permissible range, and 0% if not.
- The permissible error ranges based on the Timber Forest Resources Evaluation Protocol for estimating commercial and total height are  $\pm 25\%$ , with the rating being 5% for each if the values are within the permissible range, and 0% if not.
- Stem quality must be characterized based on the phenotype and phytosanitary status of the individual, with a score of 5% if the characterization matches, and 0% if not.
- The canopy's exposure is related to the amount of light it receives for its development, with a rating of 10% if the description matches, and 0% if it does not.
- The cup shape is related to its projection and volume, with a rating of 10% if the description matches, and 0% if it does not.
- The degree of infestation of vines in their host individuals must be equal to that reported by the evaluation teams, with a score of 5% if it matches, and 0% if it does not.
- The latizales are only evaluated for species identification, diameter, and height. Since they are not abundant, they can be effectively tracked within the sampled strips. The score is 50% if the species matches, and 0% if not; 40% if the diameter matches, and 0% if not; and 10% if the height matches, and 0% if not.
- Saplings are only evaluated for species and height identification, and since they are very abundant, this leads to errors in individual identification. Therefore, height will not be taken into account when evaluating quality. 100% is given if the identification matches, and 0% if it does not.

**Chart6. Example of data processing in the rating of the monitoring quality of one of the RN belts in terms of similarity.**

| Species | Cap Reading (cm) | Tree trunk height (m) | Total height of the tree (m) | Stem quality | Cup exhibition | Cup shape | Liana infestation |
|---------|------------------|-----------------------|------------------------------|--------------|----------------|-----------|-------------------|
|---------|------------------|-----------------------|------------------------------|--------------|----------------|-----------|-------------------|

| EC      | EV  | EC               | EV  | EP<br>(-) | EP<br>(+) | EC                    | EV | EP<br>(-) | EP<br>(+) | EC                           | EV | EP<br>(-) | EP<br>(+) | EC           | EV | EC             | EV | EC        | EV | EC                | EV |       |
|---------|-----|------------------|-----|-----------|-----------|-----------------------|----|-----------|-----------|------------------------------|----|-----------|-----------|--------------|----|----------------|----|-----------|----|-------------------|----|-------|
| SH      | SH  | 254              | 282 | 236       | 272       | 17                    | 23 | 13        | 21        | 27                           | 29 | 20        | 34        | TO           | TO | 1              | 1  | 1         | 1  | 1                 | 1  |       |
| AZ      | AZ  | 39               | 38  | 36        | 42        | 9                     | 10 | 7         | 11        | 16                           | 17 | 12        | 20        | TO           | B  | 2              | 1  | 2         | 2  | 1                 | 1  |       |
| ANN     | ANN | 111              | 118 | 103       | 119       | 13                    | 12 | 10        | 16        | 18                           | 17 | 14        | 23        | B            | B  | 2              | 2  | 1         | 1  | 1                 | 2  |       |
| SH      | ANN | 80               | 100 | 74        | 86        | 12                    | 12 | 9         | 15        | 19                           | 19 | 14        | 24        | TO           | TO | 2              | 2  | 2         | 1  | 2                 | 2  |       |
| Species |     | Cap Reading (cm) |     |           |           | Tree trunk height (m) |    |           |           | Total height of the tree (m) |    |           |           | Stem quality |    | Cup exhibition |    | Cup shape |    | Liana infestation |    | Total |
| 30      |     | 0                |     |           |           | 0                     |    |           |           | 5                            |    |           |           | 5            |    | 10             |    | 10        |    | 5                 |    | 65    |
| 30      |     | 30               |     |           |           | 5                     |    |           |           | 5                            |    |           |           | 0            |    | 0              |    | 10        |    | 5                 |    | 85    |
| 30      |     | 30               |     |           |           | 5                     |    |           |           | 5                            |    |           |           | 5            |    | 10             |    | 10        |    | 0                 |    | 95    |
| 0       |     | 0                |     |           |           | 5                     |    |           |           | 5                            |    |           |           | 5            |    | 10             |    | 0         |    | 5                 |    | 30    |
|         |     |                  |     |           |           |                       |    |           |           |                              |    |           |           |              |    |                |    |           |    |                   |    | 68.8  |

CE: Census; EV: Quality Assessment; CAP: Circumference at chest height; EP: Permissible error

Within the permissible range; Outside the permissible range

The rating for the quality of the evaluation in an RN band in the similarity format is 68.8%.

For both evaluations (qualitative and similarity) percentage values will be assigned, which correspond as follows: Qualitative evaluation 15% and Similarity evaluation 85%, this is represented by the importance that each of them has in the RN evaluations.

**Chart7. Example of the processing of the results of quality and similarity assessments in a RN belt.**

| Concept                | Evaluation weight (%) | Resulting value (%) | Total (%) |
|------------------------|-----------------------|---------------------|-----------|
| Qualitative evaluation | 15                    | 73.2                | 10.98     |
| Similarity assessment  | 85                    | 68.3                | 58.06     |
|                        |                       |                     | 69.04     |

The final result is 69.31%, corresponding to the quality monitoring of the evaluations for one RN evaluation strip. Repeat the procedure for each of the sampled strips and calculate their average. If there is more than one RN evaluation in the year, calculate the averages of the quality monitoring for all of them to obtain a final result for the activities.

The frequency of the NR assessment is subject to the scheduling of its installation or re-assessment, which will depend on the proposed objectives for sustainable forest management and the species harvested. The details of the assessments are as follows:

**Chart8. Summary of the installation and re-evaluation of RN plots in the CMRA.**

| PC | Evaluator                 | Type of evaluation | Year of evaluation |
|----|---------------------------|--------------------|--------------------|
| 08 | Chambi Pacompía, Benjamin | Facility           | 2011               |
| 11 | Chambi Pacompía, Benjamin | Facility           | 2011               |
|    | Carcheri Rosas, César     | Re-evaluation      | 2021               |
| 12 | Zapana Pilco, Fermín      | Facility           | 2016               |
| 13 | Ñaña Socualaya, Luis      | Facility           | 2018               |

|    |                      |          |      |
|----|----------------------|----------|------|
| 14 | Ñaña Socualaya, Luis | Facility | 2019 |
| 15 | Ñaña Socualaya, Luis | Facility | 2020 |

### 5.3. PLOT TREES (AP)

The person responsible for carrying out field assessments will evaluate compliance with the diameter measurements of the trees in question, and must therefore complete the evaluation forms for said operation (See Annex 3.1 and 3.2). To do so, the following points will be taken into account:

#### 5.3.1 Equipment and Materials

The following equipment and materials will be required for data collection:

- GPS Navigator
- Compass
- 3m winch
- Tape measure 10m
- Field notebook
- AP Evaluation Form
- Pencil
- Duracell AA batteries

#### 5.3.2 Qualitative evaluation

- a) Check whether the assessment team has cleared and/or removed vines, creepers, branches, ferns, and other plants that could lead to overcrowding.
- b) The measurement point on the tree must be free of branches, ferns, tumors, hollows, rot, among others that induce an under- or overestimation, and its growth in that area is not representative for growth measurements.
- c) The change of the tree's measurement point due to the growth of a tumor, rot, among other factors that have allowed an over or under estimation of the measurement must be done in accordance with the parameters established in point b).
- d) Check that the trees are properly labeled. All labels should be on the DBH and facing the cardinal east.

#### 5.3.3 Similarity evaluation

- a) To verify the correct georeferencing of the trees evaluated, the evaluator will search for the individual within 50 m. If it is not found, it will be considered nonexistent.

- b) Verify the presence of the tree tag and the corresponding code for the individual being assessed. If an individual is found without a tag, it must be verified that it matches the coordinates, diameter, height, and species data reported by the assessment teams.
- c) Check the height of the Measurement Point marked by the assessment staff.
- d) Re-evaluate the data collection of dasometric parameters, as it is a critical component of the assessment. The data should be compared with the data collected by the survey teams to calculate the permissible margin of error and take corrective measures.
  - **Circumference measurement:** Measurement of the circumference at a height of 1.3 m (CAP) in relation to ground level, however if the individual has fins or protuberance the measurement will be taken 30 cm above, if this persists, continue the ascent until the measurement is not affected.
  - **Commercial and total height:** the visual estimation of the commercial height must be carried out by positioning oneself in a place that is as close as possible to the base of the tree and where the start of the crown or main branching can also be observed, moving away from the base of the tree between 10 and 20 m (to avoid estimation errors, the distance from the tree should be equivalent to its height, if possible) in the direction that is most relevant to the estimation, considering that in the case that branches of small diameters are found and it is seen that the trunk continues, the measurement will be carried out in the highest part where the true primary or main branching occurs (where the trunk of the tree is interrupted); the estimation of the total height is surveyed up to the upper culmination of the crown, following the same practical principles described previously.
- e) **Exhibition of the cup:** It corresponds to the percentage of natural light that the canopy receives depending on the stratum in which it is located and the size of the neighboring individuals present.
- f) **Cup shape:** It corresponds to the projection and volume that it provides in its development stage to reach, in general, higher strata.

To select the individuals to be evaluated, a significant sample of 10% of the total number of individuals evaluated will be extracted.

#### **5.3.4 Processing information from forms.**

The processing of information resulting from the qualitative and similarity assessment of the quality of monitoring of diametrical growth operations by AP will be represented in percentages with respect to the effectiveness of the work performed:

Qualitative evaluations are the result of the visual inspection carried out by the evaluator, in which four ratings have been generated: Good (100%), when the operations carried out have fully complied with the standards described previously, Regular (66%), the existence of some operations that have not fully complied with the quality standards, Bad (33%), the total non-compliance with the standards but there is evidence that there was an effort to carry out the work, and Non-existent (0%), when there is no evidence of the work carried out.

The ratings include general monitoring of the activity corresponding to the diametrical growth of the evaluated individuals, which is based on the evaluator's criteria.

**Chart9. An example of data processing in the qualitative assessment of tree diameter growth monitoring.**

| Purpose of the evaluation          | Quality |         |      | Observations         | Processing quality (%) |
|------------------------------------|---------|---------|------|----------------------|------------------------|
|                                    | Bad     | Regular | Well |                      |                        |
| Cleaning the tree before measuring |         | X       |      |                      | 66                     |
| Dap Mark/Measuring Point           |         |         | X    |                      | 100                    |
| Changing the measuring point       |         |         | X    |                      | 100                    |
| Coding trees                       |         |         |      | There is no evidence | 0                      |
|                                    |         |         |      |                      | 66.5                   |

The rating for the quality of diametrical growth in trees plot in the qualitative format is 66.5%.

Similarity assessments correspond to the re-evaluation of dasometric parameters in conjunction with assessments of the forest's ecological functions. Percentage values will be generated for each assessment, representing the good or bad practices implemented.

- Georeferencing of individuals will not be considered a percentage value, however, failure to identify the position of the tree to be evaluated will result in a final score of 0%, since it is not possible to complete any of the subsequent evaluations.
- The tree code and species must be the same as those reported by the assessment team, with a score of 20% if the code and species match, and 0% if they do not.
- The measurement point must match the one reported by the evaluation team, with a score of 30% if the value matches, and 0% if it does not.
- The permissible error ranges based on the Timber Forest Resources Evaluation Protocol for circumference measurement are  $\pm 7\%$ , with the rating being 30% if the values are within the permissible range, and 0% if not.
- The permissible error ranges based on the Timber Forest Resources Evaluation Protocol for estimating commercial and total height are  $\pm 25\%$ , with the rating being 5% for each if the values are within the permissible range, and 0% if not.
- The canopy's exposure is related to the amount of light it receives for its development, with a rating of 5% if the description matches, and 0% if it does not.
- The cup shape is related to its projection and volume, with a rating of 5% if the description matches, and 0% if it does not.

**Chart10. Exemplification of data processing in the quality assessment of diametrical growth monitoring in AP in terms of similarity.**

| Diameter growth monitoring in AP in terms of similarity. |    |                     |      |                  |     |        |        |                          |    |        |        |                              |    |        |        |                |    |           |      |           |
|----------------------------------------------------------|----|---------------------|------|------------------|-----|--------|--------|--------------------------|----|--------|--------|------------------------------|----|--------|--------|----------------|----|-----------|------|-----------|
| Code                                                     |    | Measuring point (m) |      | Cap Reading (cm) |     |        |        | Tree trunk height (m)    |    |        |        | Total height of the tree (m) |    |        |        | Cup exhibition |    | Cup shape |      |           |
| EC                                                       | EV | EC                  | EV   | EC               | EV  | EP (-) | EP (+) | EC                       | EV | EP (-) | EP (+) | EC                           | EV | EP (-) | EP (+) | EC             | EV | EC        | EV   |           |
| 15                                                       | 15 | 1.3                 | 1.3  | 254              | 282 | 236    | 272    | 17                       | 23 | 13     | 21     | 27                           | 29 | 20     | 34     | 1              | 1  | 1         | 1    |           |
| 46                                                       | 47 | 1.4                 | 1.8  | 39               | 43  | 36     | 42     | 9                        | 10 | 7      | 11     | 16                           | 17 | 12     | 20     | 2              | 1  | 1         | 1    |           |
| 58                                                       | 58 | 1.45                | 1.45 | 111              | 118 | 103    | 119    | 13                       | 12 | 10     | 16     | 18                           | 17 | 14     | 23     | 2              | 2  | 1         | 2    |           |
| 43                                                       | 43 | 1.3                 | 1.3  | 80               | 100 | 74     | 86     | 12                       | 12 | 9      | 15     | 19                           | 19 | 14     | 24     | 2              | 2  | 1         | 1    |           |
| Code                                                     |    | Measuring point (m) |      | Cap Reading (cm) |     |        |        | Height of the tree trunk |    |        |        | Total height of the tree     |    |        |        | Cup exhibition |    | Cup shape |      | Total (%) |
| 20                                                       |    | 30                  |      | 0                |     |        |        | 0                        |    |        |        | 5                            |    |        |        | 5              |    | 5         |      | 65        |
| 0                                                        |    | 0                   |      | 0                |     |        |        | 5                        |    |        |        | 5                            |    |        |        | 0              |    | 5         |      | 15        |
| 20                                                       |    | 30                  |      | 30               |     |        |        | 5                        |    |        |        | 5                            |    |        |        | 5              |    | 0         |      | 95        |
| 20                                                       |    | 30                  |      | 0                |     |        |        | 5                        |    |        |        | 5                            |    |        |        | 5              |    | 5         |      | 70        |
|                                                          |    |                     |      |                  |     |        |        |                          |    |        |        |                              |    |        |        |                |    |           | 61.3 |           |

CE: Census; EV: Quality Assessment; CAP: Circumference at chest height; EP: Permissible error

■ Within the permissible range; ■ Outside the permissible range

The score for the quality of the evaluation of diametrical growth in AP in the similarity format is 61.3%.

For both evaluations (qualitative and similarity) percentage values will be assigned, which correspond as follows: Qualitative evaluation 15% and Similarity evaluation 85%, this is represented by the importance that each of them has in the AP evaluations.

**Chart11. Exemplification of the processing of the results of quality and similarity assessments in diametrical growth in AP.**

| Concept                | Evaluation weight (%) | Resulting value (%) | Total (%) |
|------------------------|-----------------------|---------------------|-----------|
| Qualitative evaluation | 15                    | 66.5                | 9.98      |
| Similarity assessment  | 85                    | 61.3                | 52.1      |
|                        |                       |                     | 62.08     |

The final result is 62.08% corresponding to the quality monitoring of diametrical growth assessments in AP.

The frequency of the PA assessment is subject to the scheduling of its reassessment; ideally, measurements should be conducted biannually after the first measurement of the tree group in the plot. Below are the details of the assessments carried out to date:



**Chart12.**Summary of the AP re-evaluation at the CMRA.

| Evaluator             | Measurement No. | Year of evaluation |
|-----------------------|-----------------|--------------------|
| Zapana Pilco, Fermín  | 1               | 2015               |
| Ñaña Socualaya, Luis  | 2               | 2017               |
| Ñaña Socualaya, Luis  | 3               | 2019               |
| Carcheri Rosas, César | 4               | 2021               |
| Ttito Huaman, Luis    | 5               | 2023               |

## 5.4 CONSERVATION AREAS (AC) AND BOUNDARIES

The person responsible for carrying out field assessments will evaluate the status of the ACs and boundaries opened in the CMRA, and must therefore complete the evaluation forms for said operation (See Annex 4). To do so, the following points will be taken into account:

### 5.4.1 Equipment and Materials

The following equipment and materials will be required for data collection:

- GPS Navigator
- Compass
- 3m winch
- Field notebook
- AC and Boundary Assessment Form
- Pencil
- Duracell AA batteries

### 5.4.2 Qualitative evaluation

- a) Check the status of land patrol perimeter boundaries whose minimum opening width must be 1.5 m.
- b) Verify the existence and marking of the vertices/milestones of the AC, PC and CMRA that allow the perimeter axes of the area to be marked.
- c) Verify the proper maintenance and/or placement of signage at vertices/milestones (Information detailing the vertex/milestone number) and information signs.

To select the lengths to be evaluated, a significant sample of 10% of the total distance traveled in the perimeter opening will be taken.

### 5.4.3 Processing information from forms

The processing of information resulting from the qualitative assessment of the quality of monitoring of ACs and boundaries will be represented in percentages with respect to the effectiveness of the work performed:

Qualitative evaluations are the result of the visual inspection carried out by the evaluator, in which four ratings have been generated: Good (100%), when the operations carried out have fully complied with the standards described previously, Regular (66%), the existence of some operations that have not fully complied with the quality standards, Bad (33%), the total non-compliance with the standards but there is evidence that there was an effort to carry out the work, and Non-existent (0%), when there is no evidence of the work carried out.

The ratings include general monitoring of the activity corresponding to what was done in the ACs and boundaries, which is based on the evaluator's criteria.

| Purpose of the evaluation | Quality |         |      | Observations         | Processing quality (%) |
|---------------------------|---------|---------|------|----------------------|------------------------|
|                           | Bad     | Regular | Well |                      |                        |
| State of the limits       |         |         | X    |                      | 100                    |
| State of the vertices     |         | X       |      |                      | 66                     |
| State of the signage      |         |         |      | There is no evidence | 0                      |
|                           |         |         |      |                      | 55.3                   |

The final result is 55.3%, corresponding to the AC and boundary quality monitoring. Repeat the procedure for each zone evaluated and calculate the average.

The evaluation frequency will be annual and based on sector prioritization, which must be part of the E&M area's annual operating plan.

## 5.5 HIGH CONSERVATION VALUE (HCV)

The person responsible for conducting field assessments will evaluate the status of the high conservation values of the concession after forest harvesting, and must therefore complete the evaluation forms for said operation (See Annex 5). To do so, the following points will be taken into account.

### 5.5.1 Equipment and Materials

The following equipment and materials will be required for data collection:

- GPS Navigator
- 3m winch
- Field notebook
- AVC Assessment Form
- Pencil
- Duracell AA batteries

### **5.5.2 Qualitative evaluation**

- a) To verify the correct georeferencing of the assessed HCVs, the evaluator will search within a 50-meter radius of the coordinates reported by the census teams. If none are found, they will be considered nonexistent.
- b) Verify the physical presence of signage in the AVCs.
- c) Detailed information on signage must be legible in its description.
- d) The signage must be oriented towards the cardinal East.
- e) The distance of the signage must be located 5 m from the identified AVC.
- f) The water tape used for marking the AVC must be yellow.
- g) Check whether compliance with the non-affectation of the HCV within the 50m diameter buffer was achieved.

The HCVs will be monitored in their entirety on the Cutting Plot or, failing that, on the harvested area. (Operating Plan, Reentry, or Balance Mobilization)

### **5.5.3 Processing information from forms**

The processing of information resulting from the qualitative assessment in the monitoring of the AVC registry and protection mechanism will be represented in percentages with respect to the effectiveness of the work carried out:

Qualitative evaluations are the result of the visual inspection carried out by the evaluator, in which four ratings have been generated: Good (100%), when the operations carried out have fully complied with the standards described previously, Regular (66%), the existence of some operations that have not fully complied with the quality standards, Bad (33%), the total non-compliance with the standards but there is evidence that there was an effort to carry out the work, and Non-existent (0%), when there is no evidence of the work carried out.

The ratings include the overall monitoring of the activity corresponding to the HCV registration, which is based on the evaluator's criteria.

**Chart13. Exemplification of data processing in the qualification of registry monitoring and HCV protection mechanism in qualitative terms.**

| Purpose of the evaluation         | Quality |         |      | Observations         | Processing quality (%) |
|-----------------------------------|---------|---------|------|----------------------|------------------------|
|                                   | Bad     | Regular | Well |                      |                        |
| Physical presence of signage      |         | X       |      |                      | 66                     |
| Signage information               |         |         | X    |                      | 100                    |
| Signage orientation               | X       |         |      |                      | 33                     |
| Distance from the tape to the AVC |         |         |      | There is no evidence | 0                      |
| Water ribbon color                |         |         | X    |                      | 100                    |
| Impact on stroke                  |         |         | X    |                      | 100                    |
|                                   |         |         |      |                      | 66.5                   |

The final result is 66.5%, corresponding to the monitoring of the HCV registry and protection mechanism. Repeat the procedure for the entire harvested area where an HCV has been identified.

The evaluation frequency will be annual, with dates corresponding to those defined in the E&M area's annual operating plan.

## 5.6 CAMPS

The person responsible for conducting field evaluations will annually evaluate 100% of the camps built by the company or its contractors (See Annex 6). The evaluation must be aimed at verifying whether the construction of the camps has followed the parameters defined by the company in the Manual for the Construction and Closure of Camps.

The following should be qualitatively evaluated:

- Camp area based on the number of rooms or staff
- Camp layout
- Slope of the terrain
- Land drainage
- State of the environments
- State of the water source
- State of the drains
- Status of the electrical system
- Quantity and condition of fire extinguishers
- Food storage

- k) Use of quicklime for the disinfection of latrines
- l) Waste separation
- m) Battery management
- n) Battery Status
- o) State of Communication Radio
- p) Signaling

### 5.6.1 Processing information from forms

The processing of information resulting from the qualitative evaluation of the quality of camp construction will be represented in percentages with respect to the effectiveness of the work performed:

Qualitative evaluations are the result of the visual inspection carried out by the evaluator, in which four ratings have been generated: Good (100%), when the operations carried out have fully complied with the standards described previously, Regular (66%), the existence of some operations that have not fully complied with the quality standards, Bad (33%), the total non-compliance with the standards but there is evidence that there was an effort to carry out the work, and Non-existent (0%), when there is no evidence of the work carried out.

The ratings include general monitoring of camp construction activity, which is based on the evaluator's judgment.

**Chart14. An example of data processing in the qualitative assessment of camp construction quality.**

| Purpose of the evaluation                    | Quality |         |      | Observations | Processing quality (%) |
|----------------------------------------------|---------|---------|------|--------------|------------------------|
|                                              | Bad     | Regular | Well |              |                        |
| Camp layout                                  |         | X       |      |              | 66                     |
| Slope of the terrain                         |         |         | X    |              | 100                    |
| Land drainage                                |         |         | X    |              | 100                    |
| State of the kitchen                         |         |         | X    |              | 100                    |
| Dormitory status                             |         |         | X    |              | 100                    |
| Work area                                    |         |         | X    |              | 100                    |
| Equipment warehouse                          |         |         | X    |              | 100                    |
| Fuel warehouse                               |         | X       |      |              | 66                     |
| Showers                                      |         |         | X    |              | 100                    |
| Latrines                                     |         |         | X    |              | 100                    |
| Waste pit                                    |         |         | X    |              | 100                    |
| State of the water source                    |         |         | X    |              | 100                    |
| Status of the electrical system              | X       |         |      |              | 33                     |
| Quantity and condition of fire extinguishers |         | X       |      |              | 66                     |
| Food storage                                 |         |         | X    |              | 100                    |

| Purpose of the evaluation | Quality |         |      | Observations | Processing quality (%) |
|---------------------------|---------|---------|------|--------------|------------------------|
|                           | Bad     | Regular | Well |              |                        |
| Use of quicklime/crosecum |         |         | X    |              | 100                    |
| Waste separation          |         |         | X    |              | 100                    |
| Battery management        |         |         | X    |              | 100                    |
| Battery status            |         |         | X    |              | 100                    |
| Radio status              |         |         | X    |              | 100                    |
| Signaling                 |         |         | X    |              | 100                    |
|                           |         |         |      |              | 91.9                   |

The final result is 91.9%, corresponding to the quality monitoring of camp construction. Repeat the procedure for each enabled camp and calculate the average.

The area occupied by the construction of the camp must be quantitatively evaluated.

## 5.7 SURVEILLANCE POSTS

The person responsible for carrying out field assessments will annually assess 100% of the operational guardhouses (See Annex 7). The assessment must be aimed at verifying the quality and condition of their infrastructure and their operation. The assessment of their operation must be aimed at verifying compliance with the custodians' functions detailed in the Comprehensive Custody Plan.

The infrastructure assessment includes:

- a) Rooms that the Garita has
- b) Slope of the terrain
- c) Land drainage
- d) State of conservation of the infrastructure
- e) State of the water source
- f) State of the drains
- g) Status of the electrical system
- h) Quantity and condition of fire extinguishers
- i) Food storage
- j) Use of quicklime for the disinfection of latrines
- k) Waste separation
- l) Battery management
- m) Battery Status

n) State of Communication Radio

o) Signaling

### 5.8.1 Processing information from forms

The processing of information resulting from the qualitative evaluation of the quality of camp construction will be represented in percentages with respect to the effectiveness of the work performed:

Qualitative evaluations are the result of the visual inspection carried out by the evaluator, in which four ratings have been generated: Good (100%), when the operations carried out have fully complied with the standards described previously, Regular (66%), the existence of some operations that have not fully complied with the quality standards, Bad (33%), the total non-compliance with the standards but there is evidence that there was an effort to carry out the work, and Non-existent (0%), when there is no evidence of the work carried out.

The ratings include general monitoring of camp construction activity, which is based on the evaluator's judgment.

**Chart15. An example of data processing in the qualitative assessment of the quality of surveillance posts.**

| Purpose of the evaluation                    | Quality |         |      | Observations | Processing quality (%) |
|----------------------------------------------|---------|---------|------|--------------|------------------------|
|                                              | Bad     | Regular | Well |              |                        |
| Camp layout                                  |         |         | X    |              | 100                    |
| Slope of the terrain                         |         |         | X    |              | 100                    |
| Land drainage                                |         |         | X    |              | 100                    |
| State of the kitchen                         |         |         | X    |              | 100                    |
| Dormitory status                             |         |         | X    |              | 100                    |
| Work area                                    |         |         | X    |              | 100                    |
| Equipment warehouse                          |         |         | X    |              | 100                    |
| Fuel warehouse                               |         |         | X    |              | 100                    |
| Showers                                      |         |         | X    |              | 100                    |
| Latrines                                     |         |         | X    |              | 100                    |
| Waste pit                                    |         |         | X    |              | 100                    |
| State of the water source                    |         |         | X    |              | 100                    |
| Status of the electrical system              | X       |         |      |              | 33                     |
| Quantity and condition of fire extinguishers |         | X       |      |              | 66                     |
| Food storage                                 |         |         | X    |              | 100                    |
| Use of quicklime/crosum                      |         |         | X    |              | 100                    |
| Waste separation                             |         |         | X    |              | 100                    |
| Battery management                           |         |         | X    |              | 100                    |
| Battery status                               |         |         | X    |              | 100                    |
| Radio status                                 |         |         | X    |              | 100                    |
| Signaling                                    |         |         | X    |              | 100                    |

| Purpose of the evaluation        | Quality |         |      | Observations | Processing quality (%) |
|----------------------------------|---------|---------|------|--------------|------------------------|
|                                  | Bad     | Regular | Well |              |                        |
| Entry authorizations             |         |         |      |              | 100                    |
| Income and expenditure logbook   |         |         |      |              | 100                    |
| Seizures of wild flora and fauna |         |         |      |              | 100                    |
|                                  |         |         |      |              | 95.2                   |

The final result is 95.2%, corresponding to monitoring the operation of the PVs. Repeat the procedure for each enabled camp and calculate the average.

## 5.8 FOREST CENSUS

The person responsible for conducting field assessments may carry out their work by evaluating areas already surveyed. The evaluator must complete the evaluation forms for this operation (See Annexes 8.1 and 8.2). The following evaluation methodology will be used.

### 5.8.1 Equipment and Materials

The following equipment and materials will be required for data collection:

- GPS Navigator
- 3m winch
- Tape measure 10m
- Field notebook
- Census Assessment Form
- Pencil
- Duracell AA batteries

### 5.8.2 Qualitative evaluation

- Office: Verify the quality of staff travel within the assigned areas by reviewing the GPS track. With the help of ArcGIS, disperse the surveyed trees so that no blank patches (areas without data) are evident. This will not be assessed for the monitoring quality process; however, it is important to properly monitor the work performed.
- Check the quality of the opening of the support paths, assessing their correct orientation with respect to the planning.
- Evaluate the correct markings and their descriptions on the markers that demarcate the start and end of the evaluation strips using stakes made of hard understory species, ensuring that the markings have a minimum durability of two years.
- Check that the trees are properly labeled. All labels should be on the DBH and facing the cardinal east.
- Check the presence of unsurveyed trees within the assessment area that are on the defined list. Record them if they meet the requirements described.



- f) Check for the presence of unregistered HCVs within the assessment area. Record them if they meet the requirements described.
- g) Check that the vertices and milestones of the Cutting Plot and the CMRA are installed, respectively.

### **5.8.3 Points to consider for the evaluation of the forest census itself:**

- a) To verify the correct georeferencing of the trees assessed, the evaluator will search for the individual within a 50-m radius of the coordinates reported by the census teams. If not found, it will be considered nonexistent.
- b) Verify the presence of the tree plaque and the corresponding code for the individual surveyed, as well as the correct marking of seed trees. If an individual is located without a plaque, verify that it matches the coordinates, diameter, height, and species data reported by the census teams.
- c) Verify the correct identification of the surveyed trees with personnel specialized in the identification of timber species in tropical forests.
- d) Re-evaluate the data collection of dasometric parameters, as it is a critical component of the assessment. The data should be compared with those collected by census teams to calculate the permissible margin of error and take corrective measures.
  - **D/C:** defines which measurement method has been determined for the tree's capacity (Diameter or Circumference), it must be recognized if the correct one has been used with respect to the phenotype that characterizes the tree.
  - **Measure D/C:** measurement of the circumference (C) at a height of 1.3 m (DBH) in relation to ground level, however if the individual has fins or a protuberance the measurement will be taken 30 cm above; projection of the diameter (D) when the fins exceed 1.5 m in height considering ground level. The projection is made at 1.30 m from the ground where the person in charge of the evaluation must stand at an approximate distance of 3 m from the base of the trunk, indicate to the support staff that the metric winch must be aligned and in this way make the projection of the corresponding trunk and take the measurement, considering taking two measurements for elliptical or irregular trunks in the shape of an "L". Verify that the evaluated trees comply with the DMC established by the company.
  - **Height:** the visual estimation of the height must be carried out by positioning oneself in a place that is as close as possible to the base of the tree and where the start of the crown or main branching can also be observed, moving away from the base of the tree between 10 to 20 m (to avoid estimation errors, the distance from the tree must be equivalent to its height, as far as possible) in the direction that is most relevant to the estimation, considering that in the case that branches of small diameters are found and it is seen that the trunk continues, the measurement will be carried out in the highest part where the true primary or main branching occurs (where the trunk of the tree is interrupted).

- e) **Stem quality:** The quality rating of the stem depends on its phenotype and phytosanitary condition. If Quality B is reported, an observation regarding the observations must be considered, such as a hollow stem, a crooked stem, etc. Additionally, the observations section will also consider whether the tree is located in a fiscal zone, its condition (dead standing or fallen naturally), and whether the individual is a chestnut tree. The individual's productivity or not will be assigned.
- f) **Cutting vines:** The evaluated trees, provided they belong to the group selected to receive silvicultural treatment, must have their vines cut within the conditions of their quantity and diameter. This group corresponds to Future Harvest Trees (FCH) and Seed Trees, and is established in the georeferenced commercial forest census manual, specifying the minimum and maximum diameters for vine cutting based on the species. The cut must be made from ground level to a height that can be safely reached with a machete.
- g) **Hotbed:** It is necessary to verify that the seed trees comply with the current technical conditions established in the terms of reference for the formulation of Management Plans and guidelines for visual inspections, and the following must be evaluated: illumination of the fully exposed and full-circle canopy, straight and healthy trunk, depending on the characteristic phenotype of the species, phytosanitary status without attacks from biological agents, and absence of lianas and vines, or with their presence but sectioned at the base.

To select the individuals to be evaluated, a significant sample will be taken from the total number of individuals surveyed monthly, for which the following formula will be applied:

$$n = \frac{N \sigma^2 Z^2}{(N - 1)e^2 + \sigma^2 Z^2}$$

Where;

n = Number of individuals to be evaluated

N = Total number of individuals counted in the PC

$\sigma$  = Standard deviation of the population, which is generally when its value is not known, a constant value of 0.5 is usually used.

Z = Value obtained using confidence levels. This is a constant value; if its value is unknown, it is taken as a 95% confidence level, equivalent to 1.96.

e = Acceptable limit of sampling error that, in the present case, will be applied at 9% (0.09), which is the maximum error that can be used when there is no information.

#### i. Processing information from forms.

The processing of information resulting from the qualitative assessment and similarities in the quality of monitoring forest census operations will be represented in percentages with respect to the effectiveness of the work performed:

Qualitative evaluations are the result of the visual inspection carried out by the evaluator, in which four ratings have been generated: Good (100%), when the operations carried

out have fully complied with the standards described previously, Regular (66%), the existence of some operations that have not fully complied with the quality standards, Bad (33%), the total non-compliance with the standards but there is evidence that there was an effort to carry out the work, and Non-existent (0%), when there is no evidence of the work carried out.

The ratings include the general monitoring of the activity corresponding to the month evaluated, based on the evaluator's criteria.

**Chart16. Exemplification of data processing in the qualitative assessment of forest census monitoring quality.**

| Purpose of the evaluation                      | Quality |         |      | Observations         | Processing quality (%) |
|------------------------------------------------|---------|---------|------|----------------------|------------------------|
|                                                | Bad     | Regular | Well |                      |                        |
| Width and direction of opened trails           |         |         | X    |                      | 100                    |
| Presence of the tape at vertices               |         | X       |      |                      | 66                     |
| Tape information in vertices                   |         |         | X    |                      | 100                    |
| Milestones at vertices                         | X       |         |      |                      | 33                     |
| Coding of trees and their seedlings            |         |         |      | There is no evidence | 0                      |
| Uncensured trees                               |         |         | X    |                      | 100                    |
| Ungeoreferenced HCV                            |         |         | X    |                      | 100                    |
| Vertices and milestones of the PC and the CMRA |         |         | X    |                      | 100                    |
|                                                |         |         |      |                      | 74.87                  |

The score for the quality of the census in the qualitative format is 74.87%.

Similarity assessments correspond to the re-evaluation of dasometric parameters in conjunction with assessments from the forest census. Percentage values will be generated for each assessment, representing the good or bad practices implemented.

- Georeferencing of individuals will not be considered a percentage value; however, failure to identify the position of the tree to be evaluated will result in a final score of 0%, since it is not possible to complete any of the subsequent evaluations.
- The tree code and species must be the same as those reported by the census brigade, with a score of 20% if the code matches, and 0% if it does not.
- The choice of diameter or circumference measurement must have a logical meaning that allows for accurate results, with a score of 5% if the measurement choice matches, and 0% if it does not.
- The permissible error ranges based on the Timber Forest Resources Evaluation Protocol for measuring diameter by projection or with a tape measure are:  $\pm 15\%$  and  $\pm 7\%$ , respectively, with the rating being 20% if the values are within the permissible range, and 0% if not.

- e) The permissible error ranges based on the Timber Forest Resources Evaluation Protocol for estimating commercial height are , with the rating being 10% if the values are within the range permissible, and 0% if not.
- f) Stem quality must be characterized based on the phenotype and physiological state of the individual, with a score of 5% if the characterization matches, and 0% if not.
- g) The observations are related to the Quality of the Stem and the particular situations in which the individual is found, with a score of 3% if the description matches, and 0% if it does not.
- h) Vine cutting must be carried out at ground level as far as the cut can safely reach, with a score of 7% if the cut or non-cut matches, and 0% if not.
- i) Seed trees must possess the characteristics of an individual of that category, with a score of 10% if they match, and 0% if they do not.

**Chart17. An example of data processing in assessing the quality of forest census monitoring in terms of similarity.**

| Monitoring in terms of similarity: |      |         |     |     |    |                      |     |        |        |                    |    |        |        |               |    |       |    |               |    |        |    |       |
|------------------------------------|------|---------|-----|-----|----|----------------------|-----|--------|--------|--------------------|----|--------|--------|---------------|----|-------|----|---------------|----|--------|----|-------|
| Tree code                          |      | Species |     | D/C |    | D/C measurement (cm) |     |        |        | Usable Height (m)  |    |        |        | Shaft Quality |    | Note. |    | Cutting vines |    | Hotbed |    |       |
| EC                                 | EV   | EC      | EV  | EC  | EV | EC                   | EV  | Ep (-) | Ep (+) | EC                 | EV | Ep (-) | Ep (+) | EC            | EV | EC    | EV | EC            | EV | EC     | EV |       |
| 324                                | 324  | AZ      | AZ  | C   | C  | 203                  | 204 | 189    | 217    | 14                 | 15 | 11     | 18     | TO            | TO |       |    |               | L  |        |    |       |
| 256                                | 256  | SH      | ANN | D   | D  | 78                   | 78  | 66     | 90     | 13                 | 15 | 10     | 16     | TO            | B  |       | FT |               |    |        |    |       |
| 1146                               | 1146 | SH      | SH  | D   | D  | 100                  | 95  | 85     | 115    | 18                 | 17 | 14     | 23     | B             | B  | HF    | HF |               |    |        |    |       |
| 9572                               | 9571 | EST     | EST | C   | D  | 240                  | 65  | 223    | 257    | 11                 | 18 | 8      | 14     | TO            | TO |       |    | L             | L  | S      | S  |       |
| Tree code                          |      | Species |     | D/C |    | D/C measurement (m)  |     |        |        | Approx. Height (m) |    |        |        | Shaft Quality |    | Note. |    | Cutting vines |    | Hotbed |    | Total |
| 20                                 |      | 20      |     | 5   |    | 20                   |     |        |        | 10                 |    |        |        | 5             |    | 3     |    | 0             |    | 10     |    | 93    |
| 20                                 |      | 0       |     | 5   |    | 20                   |     |        |        | 10                 |    |        |        | 0             |    | 0     |    | 7             |    | 10     |    | 72    |
| 20                                 |      | 20      |     | 5   |    | 20                   |     |        |        | 10                 |    |        |        | 5             |    | 3     |    | 7             |    | 10     |    | 100   |
| 0                                  |      | 20      |     | 0   |    | 0                    |     |        |        | 0                  |    |        |        | 5             |    | 3     |    | 7             |    | 10     |    | 45    |
|                                    |      |         |     |     |    |                      |     |        |        |                    |    |        |        |               |    |       |    |               |    |        |    | 77.5  |

D: Diameter; C: Circumference; EP: Permissible error; Obs.: Observations; Eval.: Evaluation.

Within the permissible range; Outside the permissible range

The census quality score for the similarity format is 77.5%.

For both evaluations (qualitative and similarity) percentage values will be assigned, which correspond as follows: Qualitative evaluation 15% and Similarity evaluation 85%, this is represented by the importance that each of them has in the forest census evaluations.

**Chart18. Example of the processing of the results of the quality and similarity assessments of the forest census**

| Concept                | Evaluation weight (%) | Resulting value (%) | Total (%) |
|------------------------|-----------------------|---------------------|-----------|
| Qualitative evaluation | 15                    | 74.87               | 11.23     |
| Similarity assessment  | 85                    | 77.5                | 65.88     |
|                        |                       |                     | 77.11     |

Finally, the final result will be evaluated according to the effectiveness indicators established by Mejía (2018), which establish that a percentage >91% corresponds to the Very effective rating, a percentage between 81-90% corresponds to Moderately effective and 80% or less corresponds to Ineffective, presenting ranges of ineffectiveness from level 0 (very ineffective) to level 3 (slightly ineffective) where the following ranges are included: 61-80% (level 3), 41-60% (level 2), 21-40% (level 1) and 0-20% (level 0).

The final result is 77.11% corresponding to the quality monitoring of census operations, which is classified as Ineffective Level 3. Repeat the procedure for all monthly evaluations and calculate the average.

The frequency with which the evaluation will be carried out will depend on the estimated time projected for the execution of the activity (generally 3 months), with 2 evaluations within the early execution stage of the operation (first month) in order to take corrective measures in a timely manner.

## 5.9 ENRICHMENT

The person responsible for conducting field evaluations will assess the condition of all seedlings used for enrichment or other treatments, using the following evaluation methodology:

- a) Conduct an assessment of forest growth, mortality, and enrichment behavior in the exploited areas of the concession.
- b) Others to consider when evaluating silvicultural treatments.

To select the individuals to be evaluated, a significant sample will be taken from the total number of transplanted individuals, for which the following formula will be applied:

$$n = \frac{N \sigma^2 Z^2}{(N - 1)e^2 + \sigma^2 Z^2}$$

Where;

n = Number of individuals to be evaluated

N = Total number of individuals transplanted in the PC

$\sigma$  = Standard deviation of the population, which is generally when its value is not known, a constant value of 0.5 is usually used.

Z = Value obtained using confidence levels. This is a constant value; if its value is unknown, it is taken as a 95% confidence level, equivalent to 1.96.

e = Acceptable limit of sampling error that, in the present case, will be applied at 9% (0.09), which is the maximum error that can be used when there is no information.

The frequency with which the evaluation will be conducted will depend on the activity being carried out. It is not currently being carried out.

## **8. MONITORING OBJECTS AND ENVIRONMENTAL IMPACT METHODOLOGY**

### **6.1 CUTTING**

#### **6.1.1 Monitoring of forest logging operations**

The person responsible for conducting field assessments may carry out their work by evaluating areas already logged or by accompanying logging crews during their work. The evaluator must complete the evaluation forms for said operation (See Annex 9.1). The following evaluation methodology will be used:

#### **Points to consider when assessing felling:**

- a) Ensure that only trees designated as suitable for harvesting are felled.
- b) The following trees must not be cut down at any time:
  - Seedbeds
  - Trees without a plaque and not on the census list
  - Trees with plaque but below the DMC
  - Cutting down trees outside the PC
- c) It is prohibited to change license plates from tree to tree.
- d) At all times you must follow the following routine during the operation:
  - Check the tree code on the plate.
  - Remove the plate.
  - Check direction of fall.
  - Make escape routes.
  - Proceed with felling, leaving a low stump and applying guided felling techniques to facilitate skidding, avoid damaging natural regeneration, obstructing waterways, HCVs, etc.
  - Place the removed plate with the nail on the stump.
- e) Permanent use of personal protective equipment (PPE)

Chainsaw operators must wear:

  - Helmet
  - Protective eye glasses
  - Hearing protector

- Steel-toed boots or shoes

Chainsaw helpers must wear:

- Helmet
- Boots or high-top shoes

### 6.1.2 Equipment and Materials to be used by the evaluator

- 10-meter winch
- Field notebook
- Logging Operations Assessment Form
- Pencil

### 6.1.3 Evaluation methodology

The Logging Assessment is conducted by monitoring ongoing logging operations or by post-completion assessments. The verification will be carried out taking into account the points indicated above. If any observations are made, they will be noted on the Logging Assessment Form (see annexes) under the findings section.

To select the individuals to be evaluated, a significant sample will be taken from those planned to be cut down in the PC, for which the following formula will be applied:

$$n = \frac{N \sigma^2 Z^2}{(N - 1) e^2 + \sigma^2 Z^2}$$

Where;

n = Number of individuals to be evaluated

N = Total number of individuals to be cut down in the PC

$\sigma$  = Standard deviation of the population, which is generally when its value is not known, a constant value of 0.5 is usually used.

Z = Value obtained using confidence levels. This is a constant value; if its value is unknown, it is taken as a 95% confidence level, equivalent to 1.96.

e = Acceptable limit of sampling error which, generally when its value is not known, a value that varies between 1% (0.01) and 9% (0.09) is usually used, a value that is at the evaluator's discretion.

The data required to be obtained from field evaluations are detailed below:

- a) **Tree code:** In this case, the tree code indicated on the metal plate will be noted. It is recommended that the plate be slightly moved because in some cases the relief



of the number is uneven, and numbers can be confused, such as 8 with 3 or 7 with 1.

- b) Species:** Enter the vernacular name of the species.
- c) UTM coordinates:** Reveal the coordinates according to GPS navigator.
- d) Qualitative evaluation:** Qualitatively evaluate the following aspects as good, fair, or poor: escape route, table cut quality, hinge cut quality, fall direction, and topping.
- e) Area impacted by the shaft (AxL):** Once the tree has been felled, the evaluator will measure the width and length of the area affected by the fallen trunk. A metric gauge will be used to take these measurements, and the measurements will be taken in meters.
- f) Area impacted by the cup (AxL):** As in the previous case, once the tree has been felled, measurements will be taken of the area affected by the crown fall. Whenever possible, the dimensions of the area affected by the crown fall will be measured with a winch. If this is not possible, the measurements will be estimated. In the latter case, the evaluator will stand over the fallen trunk or any part of the crown where they can have a good view of the entire affected area, so that the estimates are as accurate as possible.
- g) Affected individuals:** The number of individuals affected by the fall of the felled tree must be recorded. Individuals to be considered must have a DBH > 10 cm. This includes palm trees, harvestable trees, seed trees, and AFC. The affected individuals must be characterized as having no bark, no crown, broken, or felled.
- h) Number of dead animals:** It must be verified and recorded whether the fall of the tree caused the death of any animal.
- i) Affected waterways:** If the felled tree is located near a watercourse, it must be verified whether it has been affected; if so, the finding must be reported.
- j) Affected HCV sites:** It should be verified and recorded whether the tree fall affected HCV sites, recording the number affected and their type.

### Information processing:

To process the information from the logging assessment forms, a table will be created to record the assessment information, according to the following example:

**Chart19.** Logging forms information.

| Species | KAT  | CED  | SH   | STICK | SHI  | EST  | Total sum | Total impacted area/ha |
|---------|------|------|------|-------|------|------|-----------|------------------------|
| Code    | 6447 | 6448 | 6444 | 6536  | 6535 | 6441 |           |                        |

|                                          |      |      |    |    |    |    |     |        |
|------------------------------------------|------|------|----|----|----|----|-----|--------|
| Area impacted by stem (m <sup>2</sup> )  | 28.5 | 42.5 | 30 | 22 | 45 | 34 | 202 | 0.0202 |
| Area impacted by crown (m <sup>2</sup> ) | 120  | 100  | 35 | 49 | 40 | 70 | 414 | 0.0414 |
| Number of trees affected                 | 6    | 7    | 4  | 0  | 4  | 1  | 22  |        |

**Area impacted by shaft**(m<sup>2</sup>), area impacted by canopy (m<sup>2</sup>) and number of affected trees is the information for each species taken in the field, taking into account the methodology indicated above.

**The total sum**(m<sup>2</sup>) is the horizontal sum of each of the data points taken. The result of the total impacted area/ha is the same as the total sum but converted to a hectare.

Once all the information from the formats has been entered into the boxes, the following information will be processed:

#### Chart20.Processed logging information.

| Topics                                                       | Values |
|--------------------------------------------------------------|--------|
| (A) Area of PC No. 08 (ha)                                   | 2531   |
| (B) Number of trees sampled                                  | 37     |
| (C) Total number of trees cut down from PC No. 08            | 1186   |
| (D) Area impacted by the felling of 37 sampled trees (ha)    | 0.605  |
| (E) Total area impacted by felling of 1186 felled trees (ha) | 19.4   |
| (F) Trees affected by felling of 37 sampled trees            | 111    |
| (G) Trees affected by the felling of 1186 trees in PC No. 08 | 3558   |

- PC Area (ha): This information can be obtained from the PO. This is the area of the PC where the assessment was conducted.
- Number of trees sampled: This is the number of trees that have been sampled throughout the assessment.
- Total number of trees felled in the PC: This information will be the responsibility of the CoC Chief; this data will be obtained when felling is completed in the corresponding PC.
- Area impacted by the felling of sampled trees (ha): This is the sum of the entire area impacted by the evaluated samples and is obtained by adding the area impacted by the stem and the crown, from table No. 01.
- Area impacted by the felling of felled trees (ha): To obtain this result, the equation is performed with the results of points b, c, d.

$$\text{Area impacted by felling of felled trees (ha)} = \frac{\text{d) xc)}}{\text{b)}}$$

- Trees affected by felling of sampled trees: This is the result of the sum of all the affected trees in the sample, obtained from table No. 01.
- Trees affected by tree felling in the PC: to obtain this result, the equation is performed with the results of points b, c, f.

|                                                   |                           |
|---------------------------------------------------|---------------------------|
| <b>Trees affected by tree felling in the PC =</b> | $\frac{f) \times c)}{b)}$ |
|---------------------------------------------------|---------------------------|

Similarly, the data of the affected trees and branches must be used; based on their surveyed dimensions, the volume they represent at the PC level must be calculated.

### **i. Monitoring the quality of logging operations assessments**

The person responsible for carrying out field assessments will evaluate the monitoring status of the logging operation, for which he/she must complete the assessment forms (See Annex 9.2 and 9.3), taking into account the points mentioned below:

#### **Equipment and Materials**

The following equipment and materials will be required for data collection:

- GPS Navigator
- 3m winch
- Tape measure 10m
- Field notebook
- Tala Evaluation Form
- Pencil
- Duracell AA batteries

#### **Qualitative evaluation**

- a) Check the quality of the escape route orientation.
- b) Check the application of the appropriate technique (hinge cut or table cut) for felling trees.
- c) Check the orientation of the fall of the individuals in order to not harm natural regeneration as much as possible.
- d) Verify the correct application of the topping technique that allows the entire wood-bearing section of the tree to be used.
- e) Check for damage: dead animals (AM), high conservation value (HCV) and alteration of watercourses (ACA)

#### **Points to consider when assessing the impacts of logging activities:**

- a) Check if the recorded UTM coordinates correspond to the evaluated tree.
- b) Verify the correct identification of the felled species and the corresponding census code.

- c) Measure and verify the correct sizing of the area impacted by the stem and crown.
- d) Count the remaining trees affected by felling according to their category: harvestable, seed, and future harvest; as well as characterize the damage they sustained: debarked, crownless, broken, and felled.

To select the individuals to be evaluated, a significant sample of 10% of the total evaluated in the logging monitoring will be extracted, for which the following formula will be applied:

### Processing information from forms.

The processing of information resulting from the qualitative assessment and similarities in the quality of monitoring logging operations will be represented in percentages with respect to the effectiveness of the work performed:

Qualitative evaluations are the result of the visual inspection carried out by the evaluator, in which four ratings have been generated: Good (100%), when the operations carried out have fully complied with the standards described previously, Regular (66%), the existence of some operations that have not fully complied with the quality standards, Bad (33%), the total non-compliance with the standards but there is evidence that there was an effort to carry out the work, and Non-existent (0%), when there is no evidence of the work carried out.

The ratings include general monitoring of the activity and are based on the evaluator's criteria.

**Chart21. Exemplification of data processing in the qualitative assessment of logging monitoring quality.**

| Purpose of the evaluation      | Quality |         |      | Observations | Processing quality (%) |
|--------------------------------|---------|---------|------|--------------|------------------------|
|                                | Bad     | Regular | Well |              |                        |
| Orientation of escape routes   |         |         | X    |              | 100                    |
| Proper cutting technique       |         |         | X    |              | 100                    |
| Fall direction                 | X       |         |      |              | 33                     |
| Topping technique              |         |         | X    |              | 100                    |
| Involvement of AM, AVC and ACA |         | X       |      |              | 66                     |
|                                |         |         |      |              | 79.8                   |

The score for the quality of logging monitoring in the qualitative format is 79.8%.

Similarity assessments correspond to the re-evaluation of the scale of impacts on the ecosystem. Percentage values will be generated for each assessment, representing the good or bad practices implemented.

- a) Georeferencing of individuals will not be considered a percentage value; however, failure to identify the position of the tree to be evaluated will result in a final score of 0%, since it is not possible to complete any of the subsequent evaluations.

- b) The tree code and species must be the same as those reported by the census brigade, with a score of 7.5% if the code matches, and 0% if it does not.
- c) The permissible error ranges for measuring the impact area of the shaft are  $\pm 7\%$  and the impact area of the cup is  $\pm 25\%$ , the rating being 30% if the values are within the permissible range, and 0% if not.
- d) The permissible range of error for accounting for affected individuals is  $\pm 20\%$ , with the rating being 15% if the values are within the permissible range, and 0% if not (the percentage will be divided into the three types of impact: harvestable, seedbed, and future harvest). Consider whole numbers for quantification, allowing for "simple rounding" in calculations.
- e) The permissible range of error for accounting for affected individuals is  $\pm 20\%$ , with a score of 10% if the values are within the permissible range, and 0% if not (the percentage value will be divided into the four characterization types: debarked, cupless, cracked, and tumbled). Consider whole numbers for quantification, allowing for "simple rounding" in calculations.

**Chart22.**Exemplification of data processing in the rating of the quality of logging monitoring in terms of similarity.

| No. | Tree code     |       | Species     |     | Area impacted by the shaft (m2) |      |        |        | Area impacted by the crown (m2) |     |        |        | Affected individuals     |    |        |        |        |    |        |        |                |    |        |        | Characterization of the affected individuals     |    |        |        |               |      |        |        |        |    |        |        |            |   |   |   |       |
|-----|---------------|-------|-------------|-----|---------------------------------|------|--------|--------|---------------------------------|-----|--------|--------|--------------------------|----|--------|--------|--------|----|--------|--------|----------------|----|--------|--------|--------------------------------------------------|----|--------|--------|---------------|------|--------|--------|--------|----|--------|--------|------------|---|---|---|-------|
|     |               |       |             |     |                                 |      |        |        |                                 |     |        |        | Usable                   |    |        |        | Hotbed |    |        |        | Future Harvest |    |        |        | Debarking                                        |    |        |        | Without a cup |      |        |        | Broken |    |        |        | Lying down |   |   |   |       |
|     | MT            | EV    | MT          | EV  | MT                              | EV   | EP (-) | EP (+) | MT                              | EV  | EP (-) | EP (+) | MT                       | EV | EP (-) | EP (+) | MT     | EV | EP (-) | EP (+) | MT             | EV | EP (-) | EP (+) | MT                                               | EV | EP (-) | EP (+) | MT            | EV   | EP (-) | EP (+) | MT     | EV | EP (-) | EP (+) |            |   |   |   |       |
| 1   | 540           | 540   | SH          | SH  | 16                              | 15.3 | 14.9   | 17.1   | 120                             | 125 | 111.6  | 128.4  | 10                       | 10 | 8      | 12     | 0      | 0  | 0      | 0      | 0              | 2  | 0      | 0      | 4                                                | 2  | 3      | 5      | 0             | 4    | 0      | 0      | 4      | 1  | 3      | 5      | 2          | 3 | 2 | 2 |       |
| 2   | 720           | 720   | SH          | SH  | 24.7                            | 25   | 23.0   | 26.4   | 340                             | 350 | 316.2  | 363.8  | 7                        | 8  | 6      | 8      | 0      | 0  | 0      | 0      | 0              | 0  | 0      | 0      | 1                                                | 1  | 1      | 1      | 0             | 2    | 0      | 0      | 5      | 5  | 4      | 6      | 1          | 0 | 1 | 1 |       |
| 3   | 389           | 389   | SH          | SH  | 17.6                            | 17.6 | 16.4   | 18.8   | 150                             | 190 | 139.5  | 160.5  | 8                        | 8  | 6      | 10     | 0      | 1  | 0      | 0      | 2              | 2  | 2      | 2      | 3                                                | 3  | 2      | 4      | 1             | 1    | 1      | 1      | 1      | 1  | 1      | 3      | 3          | 2 | 4 |   |       |
| 4   | 15423         | 15423 | EST         | EST | 29                              | 20   | 27.0   | 31.0   | 320                             | 320 | 297.6  | 342.4  | 5                        | 9  | 4      | 6      | 1      | 1  | 1      | 1      | 0              | 0  | 0      | 0      | 2                                                | 2  | 2      | 2      | 0             | 0    | 0      | 0      | 3      | 3  | 2      | 4      | 0          | 4 | 0 | 0 |       |
| No. | Tree code (%) |       | Species (%) |     | Area impacted by the stem (%)   |      |        |        | Area impacted by the canopy (%) |     |        |        | Affected individuals (%) |    |        |        |        |    |        |        |                |    |        |        | Characterization of the affected individuals (%) |    |        |        |               |      |        |        |        |    |        |        |            |   |   |   | Total |
| 1   | 7.5           |       | 7.5         |     | 30                              |      |        |        | 30                              |     |        |        | 5                        |    |        |        | 5      |    |        |        | 0              |    |        |        | 0                                                |    |        |        | 0             |      |        |        | 0      |    |        |        | 0          |   |   |   | 85    |
| 2   | 7.5           |       | 7.5         |     | 0                               |      |        |        | 30                              |     |        |        | 5                        |    |        |        | 5      |    |        |        | 5              |    |        |        | 2.5                                              |    |        |        | 0             |      |        |        | 2.5    |    |        |        | 0          |   |   |   | 65    |
| 3   | 7.5           |       | 7.5         |     | 30                              |      |        |        | 0                               |     |        |        | 5                        |    |        |        | 0      |    |        |        | 5              |    |        |        | 2.5                                              |    |        |        | 2.5           |      |        |        | 2.5    |    |        |        | 2.5        |   |   |   | 65    |
| 4   | 7.5           |       | 7.5         |     | 30                              |      |        |        | 30                              |     |        |        | 0                        |    |        |        | 5      |    |        |        | 5              |    |        |        | 2.5                                              |    |        |        | 2.5           |      |        |        | 2.5    |    |        |        | 0          |   |   |   | 92.5  |
|     |               |       |             |     |                                 |      |        |        |                                 |     |        |        |                          |    |        |        |        |    |        |        |                |    |        |        |                                                  |    |        |        |               | 76.8 |        |        |        |    |        |        |            |   |   |   |       |

MT: Logging Monitoring; EV: Logging Monitoring Evaluation; EP: Permissible Error;

Within the permissible range; Outside the permissible range

The rating for the quality of logging monitoring in the similarity format is 76.88%.

For both evaluations (qualitative and similarity) percentage values will be assigned, which correspond as follows: Qualitative evaluation 15% and Similarity evaluation 85%, this is represented by the importance that each of them has in the logging monitoring evaluations.

**Chart23.** Exemplification of the processing of the results of the quality and similarity assessments of logging monitoring

| Concept                | Evaluation weight (%) | Resulting value (%) | Total (%) |
|------------------------|-----------------------|---------------------|-----------|
| Qualitative evaluation | 15                    | 79.8                | 11.97     |
| Similarity assessment  | 85                    | 76.8                | 65.28     |
|                        |                       |                     | 77.25     |

Finally, the final result will be evaluated according to the effectiveness indicators established by Mejía (2018), which establish that a percentage >91% corresponds to the Very effective rating, a percentage between 81-90% corresponds to Moderately effective and 80% or less corresponds to Ineffective, presenting ranges of ineffectiveness from level 0 (very ineffective) to level 3 (slightly ineffective) where the following ranges are included: 61-80% (level 3), 41-60% (level 2), 21-40% (level 1) and 0-20% (level 0).

The final result is 77.25% corresponding to the quality monitoring of logging operations.

The frequency with which the assessment will be carried out will depend on the monitoring activity, which is carried out annually in the final stages of logging operations where a better-represented sample is obtained.

## 6.2 DRAG

### ii. Monitoring of forestry skidding operations

The person responsible for conducting field assessments will evaluate areas already dragged. The evaluator must complete the evaluation forms for that operation (See Annex 10.1). The following evaluation methodology will be used:

#### Points to consider for drag assessment.

- Skidding is only permitted following the planned roads based on the topography of the land and the location or distribution of the trunks or logs to be skidded.
- Obstructing permanent or seasonal waterways larger than 1.5 m wide is strictly prohibited. If warranted, bridges or culverts must be built. See procedures in the manual.
- Skidding may only be carried out using an articulated wheeled forestry tractor. Skidding with crawler tractors or similar that do not have appropriate attachments for suspending one end of the log during skidding is prohibited.
- At all times you must follow the following routine during the operation:
  - Check the tree code on the plaque on the stump and write it down when marking the log and completing the forms.
  - The cable is placed on the log and the log is dragged with one end of the log suspended by the tractor winch.
  - Place the logs neatly in the stockpile yard

- e) In the yard, the information must be completed on the forms designated for controlling skidding, noting the log code and its measurements.
- f) Permanent use of personal protective equipment (PPE), operators must wear the following:
  - Helmet
  - Steel-toed boots or shoes

Operator assistants must wear:

- Helmet
- Gloves
- Steel-toed boots or shoes
- Machete

**Note:** Each tractor must have a 2-4 kg PQS fire extinguisher

### **Methodology to follow for the evaluation of the Drag operation and filling out the forms.**

The person responsible must have certain equipment and materials for carrying out the evaluation, as well as consider the evaluation criteria and completion of the forms described below:

### **Equipment and Materials**

The following equipment and materials will be required for data collection:

- GPS Navigator
- Winch of 10 meters or more
- Tow map with grids every 250 m (evaluation plots)
- Field notebook
- Drag Evaluation Form
- Pencil
- Duracell AA batteries

### **Evaluation methodology**

To carry out skidding operations assessments, it is recommended that at least 50% of the annual felling plot (PC) area has been felled and skidded.



Using the GIS program, grids spaced every 250 meters are defined on the PC in such a way that evaluation plots of 250 mx 250 m are formed.

Once the map of the trees carried along with the evaluation subplots has been prepared, they will be numbered. The field manager will be responsible for ensuring the numbering order. Only those plots whose entire area is within the PC will be considered evaluation plots. If part of a plot's area falls outside the PC, it will not be considered in the evaluation.

Once the evaluation plots have been enumerated, the sample to be evaluated will be randomly selected and the UTM coordinates of its vertices will be entered into the GPS receiver.

To calculate the number of subplots that are significant for the assessment, the following formula will be applied:

$$n = \frac{N \sigma^2 Z^2}{(N - 1)e^2 + \sigma^2 Z^2}$$

Where;

n = Number of subplots to be evaluated

N = Total number of complete subplots in the PC (250mX250m).

$\sigma$  = Standard deviation that, generally when you do not have its worth, a constant value of 0.5 is usually used.

Z = Value obtained using confidence levels. This is a constant value; if its value is unknown, it is taken as a 95% confidence level, equivalent to 1.96.

e = Acceptable limit of sampling error which, generally when its value is not known, is usually used as a value that varies between 1% (0.01) and 9% (0.09), a value that is at the discretion of the surveyor.

To assess the selected plots, they will be located in the field using GPS. Once positioned in the field, a route will be taken around the entire plot, gathering the information required for the Towing Assessment Form. To determine whether the route taken by the evaluator is within the plot, the GPS tool will be used to define the perimeter using the previously entered coordinates of the vertices.

The information required to be collected in the Towing Evaluation Forms is as follows:

- a) **UTM coordinates:**Reveal the coordinates according to GPS navigator.
- b) **Qualitative evaluation:**Qualitatively assess the following aspects as good, fair, or poor: width of the dragline (in terms of opening quality), the occurrence of fuel or lubricant spills at or near the assessment point, and the occurrence of parallel tracks connecting the same tree to the same yard.
- c) **Width of the road (m):**Measurements begin 20 m from the stump of the harvested individual, due to the maneuverability of the forest tractor. Five measurements, spaced 10 m apart, must be taken in each assessment section. The UTM

coordinates collected from the GPS correspond to the first point in the section. Depending on the length of the road within the assessment plot, several assessment sections may be considered for a single road.

- d) Affected individuals:** The number of individuals affected by the fall of the felled tree must be recorded. Individuals to be considered must have a DBH > 10 cm. This includes palm trees, harvestable trees, seed trees, and AFC. The affected individuals must be characterized as having no bark, no crown, broken, or felled.
- e) Number of dead animals:** Check and record whether any animal has died as a result of the dragging.
- f) Number of watercourse blockages:** This consists of verifying whether any watercourses have been obstructed or affected in or near the section being assessed. If this is the case, the number of affected watercourses should be noted. If during the assessment, affected watercourses are found in sectors other than the assessment section, these should also be recorded in the findings section, noting the UTM coordinates of their location and describing the type of impact.
- g) Number of affected HCV sites:** It must be verified and recorded whether any HCV sites were affected within the assessment section. HCV sites are often important sites for wildlife (clay licks, burrows, nests, bathing sites, etc.). The number and type of affected sites must be recorded.

**IMPORTANT:** The skid road length consists of measuring the length of all skid roads within the sample plot. Skid roads will only be measured once, so multiple logs may have been skidded along the same road. Primary and secondary roads will not be considered in this assessment. Skid road length is determined using the Track function of the GPS navigator. Track information must be downloaded to the GIS every day at the end of the workday, and maps of the tracks and locations of the sampling points for each evaluation plot must be created.

### Processing information from forms.

As in the case of logging, Microsoft Excel will be used to process the information collected in the drag assessment. This program will be used to create the tables shown below:

**Chart24. Drag-and-drop form information.**

| Topics                             | Values  |
|------------------------------------|---------|
| (A) Drag distance (m)              | 561     |
| (B) Road width (m)                 | 3.56    |
| (C) Number of affected individuals | 12      |
| (A) x (B) (m <sup>2</sup> )        | 1997.16 |

The number of the evaluated plot will be indicated in the table header.

**Drag length:** is the drag length measured using the GPS track function.

**Road width:** It is the average of all measurements taken in the different sections used to evaluate the drag roads in an evaluation plot.

**Affected trees:** These are the trees affected by the dragging of logs within the assessment sections.

**Impacted area:** It is the product of multiplying the drag length by the average width of the road.

Once all the information for the formats has been entered into Microsoft Excel, the following information will be processed:

**Chart25. Processed drag information.**

| Topics                                           | Values |
|--------------------------------------------------|--------|
| (A) Side of the sampling subplot (m)             | 250    |
| (B) Area of sampling subplots (ha)               | 6.25   |
| (C) No. of sub-plots evaluated                   | 9      |
| (D) Area evaluated (ha)                          | 56.25  |
| (E) Impacted area in 9 evaluated sub-plots (ha)  | 1.2    |
| (F) % of impacted area in 9 evaluated subplots   | 2.1    |
| (G) Area of PC No. 08 (ha)                       | 2531   |
| (H) Total area impacted on PC No. 08 (ha)        | 53.8   |
| (I) Number of affected individuals in the sample | 115    |
| (J) Number of affected individuals in PC No. 08  | 5174   |

- a) Side of sample plot (m): The side of the sample plots is 250 m.
- b) Sampling plot area (ha): The plot area will be the result of the product of the sides.
- c) Number of plots evaluated: This is the number of plots taken as a sample.
- d) Evaluated area (ha): The evaluated area will be the product of the results of points b, c.

**Evaluated area (ha)= bxc**

- e) Impacted area in... assessed plots (ha): This is the sum of the impacted areas of all assessed plots. Table 3 shows the impacted area in an assessed plot. The total number of assessed subplots is entered in the dotted space.
- f) % of impacted area in... evaluated plots: This is the % result of the following equation. The total number of evaluated plots will be entered in the dotted space.

**% of impacted area in ..... evaluated plots= ex 100 / d**

- g) PC Area ..... : This result is obtained from the corresponding POA.
- h) Total area impacted on the PC ... (ha): It is the result of the product of g x f.

**Total area impacted on the PC... (ha)= gxf**

- i) Number of affected individuals in the sample: This is the sum of the affected individuals in each subplot evaluated. Table 3 shows the results for a subplot.
- j) Number of individuals affected in PC...: is the result of the following equation.

$$\text{Number of individuals affected by CP...} = ixg / d$$

The same procedure must be followed with the data of the affected trees; based on their measured dimensions, the volume they represent at the PC level must be calculated.

### iii. **Monitoring the quality of trawl operations assessments**

The person responsible for carrying out field evaluations will assess the monitoring status of the towing operation, for which he/she must complete the evaluation forms (See Annex 10.2 and 10.3), taking into account the points mentioned below:

#### **Equipment and Materials**

The following equipment and materials will be required for data collection:

- GPS Navigator
- Tape measure 30m
- Field notebook
- Drag Evaluation Form
- Pencil
- Duracell AA batteries

#### **Qualitative evaluation**

- a) Verify the quality of the road width. This includes operators selecting appropriate road openings to facilitate access, avoid steep slopes, and minimize damage to the ecosystem as much as possible.
- b) Check for fuel spills caused by the operation of forestry tractors.
- c) Verify the presence of parallel roads whose alteration causes an increase in the degraded areas inherent to the operation.
- d) Check for damage: dead animals (AM), high conservation value (HCV) and alteration of watercourses (ACA)

#### **Points to consider when assessing the impacts of trawling activities:**

- a) Check if the recorded UTM coordinates correspond to the initial evaluation point.
- b) Measure and verify that the correct measurements of the road widths have been made.

- c) Measure and verify that the correct measurement of the length of the evaluated segment of the drag road has been made.
- d) Count the remaining trees affected by drifting according to their category: harvestable, seed, and future harvest; as well as characterize the damage they sustained: debarked, crownless, broken, and felled.

To select the plots to be evaluated, a significant sample of 10% of the total evaluated in the drag monitoring will be extracted, for which the following formula will be applied:

#### **Processing information from forms.**

The processing of information resulting from the qualitative assessment and similarities in the quality of monitoring of towing operations will be represented in percentages with respect to the effectiveness of the work performed:

Qualitative evaluations are the result of the visual inspection carried out by the evaluator, in which four ratings have been generated: Good (100%), when the operations carried out have fully complied with the standards described previously, Regular (66%), the existence of some operations that have not fully complied with the quality standards, Bad (33%), the total non-compliance with the standards but there is evidence that there was an effort to carry out the work, and Non-existent (0%), when there is no evidence of the work carried out.

The ratings include general monitoring of the activity and are based on the evaluator's criteria.

**Chart26. Exemplification of data processing in the qualitative assessment of trawl monitoring quality.**

| Purpose of the evaluation        | Quality |         |      | Observations | Processing quality (%) |
|----------------------------------|---------|---------|------|--------------|------------------------|
|                                  | Bad     | Regular | Well |              |                        |
| Quality of track width           |         |         | X    |              | 100                    |
| Presence of fuel spills          |         |         | X    |              | 100                    |
| Presence of unevaluated pathways |         |         | X    |              | 100                    |
| Presence of parallel tracks      |         | X       |      |              | 66                     |
| Affectation: AM, AVC and ACA     |         |         | X    |              | 100                    |
|                                  |         |         |      |              | 93.2                   |

The rating for the quality of drag monitoring in the qualitative format is 93.2%.

Similarity assessments correspond to the re-evaluation of the scale of impacts on the ecosystem. Percentage values will be generated for each assessment, representing the good or bad practices implemented.

- The georeferencing of the initial evaluation point will not be considered a percentage value; however, failure to identify the position to be evaluated will result in a final grade of 0%, since it is not possible to complete any subsequent evaluations.
- The measurement considered for the evaluations of the width of the road will be the final average of all the measurements per evaluated section, having as permissible error range the  $\pm 7\%$ , with the score being 40% if the code matches, and 0% if it doesn't. Percentage values should be divided equally for each point per segment evaluated.
- The permissible error range for measuring the length of the evaluated section of a road is  $\pm 7\%$ , with the rating being 35% if the values are within the permissible range, and 0% if not.
- The permissible range of error for accounting for affected individuals is  $\pm 20\%$ , with the rating being 15% if the values are within the permissible range, and 0% if not (the percentage will be divided into the three types of impact: harvestable, seedbed, and future harvest). Consider whole numbers for quantification, allowing for "simple rounding" in calculations.
- The permissible range of error for the characterization of affected individuals is  $\pm 20\%$ , with a score of 10% if the values are within the permissible range, and 0% if not (the percentage value will be divided into the four characterization types: debarked, cupless, cracked, and tumbled). Consider whole numbers for quantification, allowing for "simple rounding" in calculations.

**Chart27.**Exemplification of data processing in the quality rating of drag monitoring in terms of similarity.

| Subplot | Average width of the road (m) |     |        |        | Distance (m) |    |        |        | Affected individuals     |    |        |        |        |    |        |        |                |    |        |        | Characterization of the affected individuals     |    |        |        |               |    |        |        |        |       |        |        |            |   |       |   |      |
|---------|-------------------------------|-----|--------|--------|--------------|----|--------|--------|--------------------------|----|--------|--------|--------|----|--------|--------|----------------|----|--------|--------|--------------------------------------------------|----|--------|--------|---------------|----|--------|--------|--------|-------|--------|--------|------------|---|-------|---|------|
|         |                               |     |        |        |              |    |        |        | Usable                   |    |        |        | Hotbed |    |        |        | Future harvest |    |        |        | Debarking                                        |    |        |        | Without a cup |    |        |        | Broken |       |        |        | Lying down |   |       |   |      |
|         | MT                            | EV  | EP (-) | EP (+) | MT           | EV | EP (-) | EP (+) | MT                       | EV | EP (-) | EP (+) | MT     | EV | EP (-) | EP (+) | MT             | EV | EP (-) | EP (+) | MT                                               | EV | EP (-) | EP (+) | MT            | EV | EP (-) | EP (+) | MT     | EV    | EP (-) | EP (+) |            |   |       |   |      |
| 106     | 3.5                           | 3.4 | 3.3    | 3.7    | 50           | 50 | 46.5   | 50.0   | 10                       | 10 | 8      | 12     | 0      | 0  | 0      | 0      | 0              | 2  | 0      | 0      | 4                                                | 2  | 3      | 5      | 0             | 4  | 0      | 0      | 4      | 1     | 3      | 5      | 2          | 3 | 2     | 2 |      |
| 98      | 3.26                          | 3.3 | 3.0    | 3.5    | 6            | 8  | 5.6    | 6.4    | 7                        | 8  | 6      | 8      | 0      | 0  | 0      | 0      | 0              | 0  | 0      | 0      | 1                                                | 1  | 1      | 1      | 0             | 2  | 0      | 0      | 5      | 5     | 4      | 6      | 1          | 0 | 1     | 1 |      |
| 101     | 3.34                          | 4   | 3.1    | 3.6    | 50           | 40 | 46.5   | 50.0   | 8                        | 8  | 6      | 10     | 0      | 1  | 0      | 0      | 2              | 2  | 2      | 2      | 3                                                | 3  | 2      | 4      | 1             | 1  | 1      | 1      | 1      | 1     | 1      | 1      | 3          | 3 | 2     | 4 |      |
| 108     | 3.2                           | 3.4 | 3.0    | 3.4    | 50           | 50 | 46.5   | 50.0   | 5                        | 9  | 4      | 6      | 1      | 1  | 1      | 1      | 0              | 0  | 0      | 0      | 2                                                | 2  | 2      | 2      | 0             | 0  | 0      | 0      | 3      | 3     | 2      | 4      | 0          | 4 | 0     | 0 |      |
| No.     | Average width of the road (%) |     |        |        | Distance (%) |    |        |        | Affected individuals (%) |    |        |        |        |    |        |        |                |    |        |        | Characterization of the affected individuals (%) |    |        |        |               |    |        |        |        |       |        |        |            |   | Total |   |      |
| 106     | 40                            |     |        |        | 35           |    |        |        | 5                        |    |        |        | 5      |    |        |        | 0              |    |        |        | 0                                                |    |        |        | 0             |    |        |        | 0      |       |        |        | 0          |   |       |   | 80   |
| 98      | 40                            |     |        |        | 0            |    |        |        | 5                        |    |        |        | 5      |    |        |        | 5              |    |        |        | 2.5                                              |    |        |        | 0             |    |        |        | 2.5    |       |        |        | 0          |   |       |   | 60   |
| 101     | 0                             |     |        |        | 0            |    |        |        | 5                        |    |        |        | 0      |    |        |        | 5              |    |        |        | 2.5                                              |    |        |        | 2.5           |    |        |        | 2.5    |       |        |        | 2.5        |   |       |   | 20   |
| 108     | 40                            |     |        |        | 35           |    |        |        | 0                        |    |        |        | 5      |    |        |        | 5              |    |        |        | 2.5                                              |    |        |        | 2.5           |    |        |        | 2.5    |       |        |        | 0          |   |       |   | 87.5 |
|         |                               |     |        |        |              |    |        |        |                          |    |        |        |        |    |        |        |                |    |        |        |                                                  |    |        |        |               |    |        |        |        | 61.88 |        |        |            |   |       |   |      |

MT: Logging Monitoring; EV: Logging Monitoring Evaluation; EP: Permissible Error;

Within the permissible range; Outside the permissible range

The rating for the quality of logging monitoring in the similarity format is 61.88%.

For both evaluations (qualitative and similarity) percentage values will be assigned, which correspond as follows: Qualitative evaluation 15% and Similarity evaluation 85%, this is represented by the importance that each of them has in the evaluations of the drag monitoring.

**Chart 28.** Exemplification of the processing of the results of the quality and similarity assessments of drag monitoring.

| Concept                | Evaluation weight (%) | Resulting value (%) | Total (%)    |
|------------------------|-----------------------|---------------------|--------------|
| Qualitative evaluation | 15                    | 93.2                | 13.98        |
| Similarity assessment  | 85                    | 61.88               | 52.60        |
|                        |                       |                     | <b>66.58</b> |

Finally, the final result will be evaluated according to the effectiveness indicators established by Mejía (2018), which establish that a percentage >91% corresponds to the Very effective rating, a percentage between 81-90% corresponds to Moderately effective and 80% or less corresponds to Ineffective, presenting ranges of ineffectiveness from level 0 (very ineffective) to level 3 (slightly ineffective) where the following ranges are included: 61-80% (level 3), 41-60% (level 2), 21-40% (level 1) and 0-20% (level 0).

The final result is 66.58% corresponding to the quality monitoring of towing operations, which coincides with the Ineffective Level 3 category.

The frequency with which the evaluation will be carried out will depend on the monitoring activity, which is carried out annually in the final stages of trawling operations where a better-represented sample is obtained.

## 6.3 STORAGE YARDS

### iv. Monitoring of storage yard operations

The evaluation of the Storage Yards must be completed 100%, avoiding sampling and data extrapolation, except in cases of force majeure, which may occur due to weather conditions, accessibility, or limited resources allocated for monitoring. The evaluator must complete the evaluation form for said operation (See Annex 11.1). The following evaluation methodology will be used:

#### Points to consider when evaluating the storage yard.

- The logs, if possible, should be placed in an orderly manner in the stockpile yard.
  - In the yard, the information must be completed on the forms designated for controlling skidding, noting the log code and its measurements.
  - There must be proper management of waste, fuels and lubricants.
  - Permanent use of personal protective equipment (PPE), operators must wear the following:
    - Helmet
    - Steel-toed boots or shoes
- Operator assistants must wear:
- Helmet



- Gloves
- Steel-toed boots or shoes
- Machete

**Note:** Each tractor or front loader must have a 2-4 kg PQS fire extinguisher

### **Methodology to follow for the evaluation of the storage yards and completion of the forms.**

The person responsible must have certain equipment and materials for carrying out the evaluation, as well as consider the evaluation criteria and completion of the forms described below:

### **Equipment and Materials**

The following equipment and materials will be required for data collection:

- GPS Navigator
- Winch of 10 meters or more
- Field notebook
- Patio Evaluation Form
- Pencil
- Duracell AA batteries

### **Evaluation methodology**

The information required to be collected in the Storage Yard Evaluation Form is as follows:

- a) Patio No.:** Yard number assigned by forest harvesting personnel.
- b) UTM coordinates:** Take the coordinates using a GPS navigator and position yourself in the center of the yard.
- c) Qualitative evaluation:** Qualitatively evaluate the following aspects as good, regular or bad: the occurrence of fuel or lubricant spills, solid waste management, yard drainage, the quality of log coding (The code must include the concession reference (CMRA: Consolidated Maderacre), number of the felling plot (PC), tree number and if the trunk is divided into more than one log, a corresponding sequence of letters must also be included, such as: "A", "B", "C", "D", etc.), the slope of the land (<5%), order of the logs (location of logs in parallel and grouped in piles distributed by groups according to the Concession, the PC of origin and species level) and the quality of the loading of the logs onto the trucks.
- d) Patio Area:** The width (m) and length (m) of the cleared area for the construction of the patio must be recorded.

- e) **Impacted area outside the yard:**The width (m) and length (m) of the area occupied by the accumulation of plant debris or soil on the sides of the yard and which has affected the surrounding forest must be measured.
- f) **Used area of the patio:**The area actually used in the yard for log storage must be measured. This measurement should only be recorded if the yard is occupied by logs at the time of the assessment (just after skidding has been completed and before transport has begun).
- g) **Number of dead animals:**Check and record whether any animal has died as a result of the construction of the yard.
- h) **Alteration of watercourses:**This consists of verifying whether watercourses have been affected by the construction of the patio. If so, the number of affected watercourses should be noted. If, during the assessment, affected watercourses are found in sectors other than the assessment point, these should also be recorded in the findings section, noting the UTM coordinates of their location and describing the type of impact. The patio should be located <50 m from watercourses or bodies of water.
- i) **Number of affected HCV sites:**It must be verified and recorded whether any HCV sites were affected by the construction of stockpile yards. HCV sites are often important sites for wildlife (clay licks, burrows, nests, bathing sites, etc.). The number and type of affected sites must be recorded. The construction of yards within 25 m of HCVF is prohibited.

### **Processing information from forms.**

Microsoft Excel will be used to process the information collected during the yard assessment, and calculation tables will be created with this program.

### **v. Monitoring the quality of stockyard operations evaluations**

The person responsible for conducting field assessments will evaluate the monitoring status of the storage yard operation, and must therefore complete the assessment forms (See Annex 11.2 and 11.3). To do so, the following points will be taken into account:

#### **Equipment and Materials**

The following equipment and materials will be required for data collection:

- GPS Navigator
- Tape measure 30m
- Field notebook
- Patio Evaluation Form
- Pencil
- Duracell AA batteries

### **Qualitative evaluation**

- a) Check for fuel spills caused by the operation of forestry tractors.
- b) Check for the presence of solid waste.
- c) Check whether the storage yard has adequate drainage that prevents water from accumulating after rain.
- d) Check whether the stockpile yard location has a gentle slope to minimize the risk of logs rolling throughout the operation (loading preparation and loading).
- e) Check whether the logs have been coded according to the methodology of the Forestry Operations Manual.
- f) Check whether the logs have been classified according to their length.
- g) Check for damage: dead animals (AM), high conservation value (HCV) and alteration of watercourses (ACA)

### **Points to consider when assessing the impacts of yard activity:**

- a) Check if the recorded UTM coordinates correspond to the evaluation yard.
- b) Measure and verify that the correct measurements have been made of the width and length of the storage yard.
- c) Measure and verify that the correct measurement of the width and length of the impact produced outside the storage yard due to its opening has been made.

To select the yards to be evaluated, a significant sample of 10% of the total evaluated in the yard monitoring will be taken.

### **Processing information from forms.**

The processing of information resulting from the qualitative assessment and similarities in the quality of monitoring of stockyard operations will be represented in percentages with respect to the effectiveness of the work performed:

Qualitative evaluations are the result of the visual inspection carried out by the evaluator, in which four ratings have been generated: Good (100%), when the operations carried out have fully complied with the standards described previously, Regular (66%), the existence of some operations that have not fully complied with the quality standards, Bad (33%), the total non-compliance with the standards but there is evidence that there was an effort to carry out the work, and Non-existent (0%), when there is no evidence of the work carried out.

The ratings include general monitoring of the activity and are based on the evaluator's criteria.

**Chart29. Exemplification of data processing in the qualitative assessment of trawl monitoring quality.**

| Purpose of the evaluation         | Quality |         |      | Observations | Processing quality (%) |
|-----------------------------------|---------|---------|------|--------------|------------------------|
|                                   | Bad     | Regular | Well |              |                        |
| Presence of fuel spillage         |         |         | X    |              | 100                    |
| Waste management                  |         | X       |      |              | 66                     |
| Proper yard drainage              |         |         | X    |              | 100                    |
| Gentle slope for log accumulation |         |         | X    |              | 100                    |
| Log coding                        |         |         | X    |              | 100                    |
| Order of the logs                 |         | X       |      |              | 66                     |
| Affectation: AM, AVC and ACA      |         |         | X    |              | 100                    |
|                                   |         |         |      |              | <b>90.28</b>           |

The rating for the quality of monitoring of storage yards in the qualitative format is 90.28%.

Similarity assessments correspond to the re-evaluation of the scale of impacts on the ecosystem. Percentage values will be generated for each assessment, representing the good or bad practices implemented.

- The permissible error range for measuring the area of the storage yards is  $\pm 7\%$ , with the rating being 75% if the values are within the permissible range, and 0% if not.
- The permissible error range for measuring the impacted area outside the storage yards is  $\pm 7\%$ , with the rating being 25% if the values are within the permissible range, and 0% if not.

**Chart30.**Exemplification of data processing in the quality rating of stockpile yard monitoring in terms of similarity.

| Patio No. | Storage yard area (ha) |       |        |        | Impacted area outside the stockpile yard (ha) |       |        |        |       |
|-----------|------------------------|-------|--------|--------|-----------------------------------------------|-------|--------|--------|-------|
|           | MT                     | EV    | EP (-) | EP (+) | MT                                            | EV    | EP (-) | EP (+) |       |
| 23        | 0.077                  | 0.080 | 0.072  | 0.082  | 0.053                                         | 0.051 | 0.049  | 0.057  |       |
| 14        | 0.157                  | 0.161 | 0.146  | 0.168  | 0.083                                         | 0.099 | 0.077  | 0.089  |       |
| 48        | 0.164                  | 0.182 | 0.153  | 0.175  | 0.044                                         | 0.035 | 0.041  | 0.047  |       |
| 90        | 0.161                  | 0.171 | 0.150  | 0.172  | 0.031                                         | 0.032 | 0.029  | 0.033  |       |
| No.       | Storage yard area (%)  |       |        |        | Area impacted by the canopy (%)               |       |        |        | Total |
| 23        | 75                     |       |        |        | 25                                            |       |        |        | 100   |
| 14        | 75                     |       |        |        | 0                                             |       |        |        | 75    |
| 48        | 0                      |       |        |        | 0                                             |       |        |        | 0     |
| 90        | 75                     |       |        |        | 25                                            |       |        |        | 100   |
|           |                        |       |        |        |                                               |       |        |        | 68.75 |

MT: Logging Monitoring; EV: Logging Monitoring Evaluation; EP: Permissible Error;

■ Within the permissible range; ■ Outside the permissible range

The rating for the quality of monitoring of storage yards in the similarity format is 68.75%.

For both evaluations (qualitative and similarity) percentage values will be assigned, which correspond as follows: Qualitative evaluation 15% and Similarity evaluation 85%, this is represented by the importance that each of them has in the evaluations of the monitoring of stockpile yards.

**Chart31.**Example of the processing of the results of the quality and similarity assessments of the monitoring of stockpile yards

| Concept                | Evaluation weight (%) | Resulting value (%) | Total (%) |
|------------------------|-----------------------|---------------------|-----------|
| Qualitative evaluation | 15                    | 90.28               | 13.54     |
| Similarity assessment  | 85                    | 68.75               | 58.41     |
|                        |                       |                     | 71.95     |

Finally, the final result will be evaluated according to the effectiveness indicators established by Mejía (2018), which establish that a percentage >91% corresponds to the Very effective rating, a percentage between 81-90% corresponds to Moderately effective and 80% or less corresponds to Ineffective, presenting ranges of ineffectiveness from level 0 (very ineffective) to level 3 (slightly ineffective) where the following ranges are included: 61-80% (level 3), 41-60% (level 2), 21-40% (level 1) and 0-20% (level 0).

The final result is 71.95% corresponding to the quality monitoring of stockyard operations, which is classified as Ineffective Level 3. Repeat the procedure for all monthly evaluations and calculate the average.

The frequency with which the evaluation will be carried out will depend on the monitoring activity, which is carried out annually in the final stages of storage yard operations where a better-represented sample is obtained.

## **6.4 FOREST ROADS**

### **vi. Monitoring forest road operations**

The person responsible for carrying out field evaluations must complete the evaluation forms for said operation (See Annex 12.1), for which the following evaluation methodology will be taken into account.

#### **Points to consider during road construction assessment.**

- a) Road construction and rehabilitation are only permitted following the planned routes based on the terrain's topography.
- b) The technical standards established for road construction, as stipulated in the forestry operations manual and regulations, must be followed at all times.
- c) It is strictly prohibited to obstruct permanent or seasonal waterways larger than 1.5 m wide; if warranted, bridges or culverts must be built.
- d) Permanent use of personal protective equipment (PPE).

Operators must use the following:

- Helmet
- steel-toed boots or shoes.

Operator assistants must wear:

- Helmet
- steel-toed boots or shoes.

Note: Each tractor must have a 2-4 kg PQS fire extinguisher.

#### **Methodology to follow for the evaluation of Paths and filling out the forms.**

The person responsible must have certain equipment and materials for carrying out the evaluation, as well as consider the evaluation criteria and completion of the forms described below:

#### **Equipment and Materials**

- GPS

- 10-meter winch
- Field notebook
- Road Assessment Form
- Pencil
- Duracell AA batteries

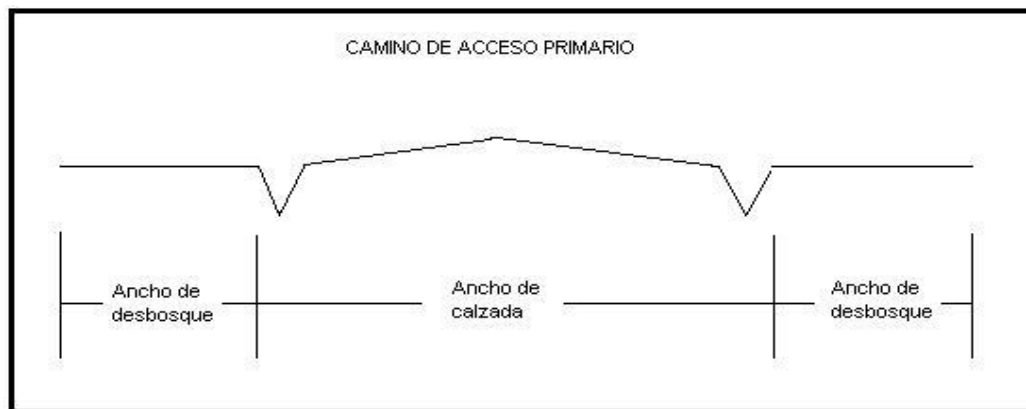
### Evaluation methodology

This assessment will be carried out as road construction or rehabilitation progresses.

The GPS navigator's track tool will be used to measure the length of new and maintained roads.

A surveyor's winch will be used to measure the width of the lateral and roadway clearing. Several measurements must be taken along the entire length of the roads, and the UTM coordinates of the assessment points must also be recorded.

Figure 1 shows the sections of an access road. This information is required to complete the road assessment forms. The "roadway width" is defined as the section occupied by the rolling surface plus the side ditches, and the "forest width" is defined as the side sections extending from the end of the ditch to the undisturbed forest. Measurements of both sides must be recorded.



**Figure1. Description of a primary access road**

It should be noted that secondary roads typically do not have ditches or clearings on the sides due to their seasonal and short-term use.

The information required to be collected in the Road Evaluation Forms is as follows:

- a) Type of Roads:** It must be recorded whether an access road, primary or secondary, is being evaluated:
  - Access Roads: Forest road running from the town center where the industry is located to the start of the PC. It has a contoured road surface, drainage works, and cleared sides.

- **Main Road:** forest road located within the PC and having a profiled rolling surface, drainage works and lateral clearing
- **Secondary road:** a road used seasonally and for a short period of time, normally no longer than one harvest. These are branches that branch off a main road and, due to their ephemeral use, do not require a profiled rolling surface, drainage works or clearing of the sides.

**b) UTM coordinates:**Reveal the coordinates according to GPS navigator.

**c) Qualitative evaluation:**Qualitatively evaluate the following aspects as good, fair, or poor: gradient, road condition in terms of maintenance quality, condition of gutters, condition of signage, presence of fuel or lubricant spills in the section under evaluation.

**d) Width of the roadway (m):**Five measurements should be taken in each assessment section, spaced 20 m apart; the width of the roadway includes gutters. The sections to be measured will be spaced 1 km apart for primary roads and 0.5 km apart for secondary roads. The UTM coordinates collected from the GPS correspond to the first point of the section. Several assessment sections should be considered to characterize a single road; the number of sections to be used will depend on the length of the road.

**e) Width of sides (m):**Five measurements should be taken in each assessment section, spaced 20 m apart. The lateral sections comprise the sections on both sides of the road that extend from the end of the ditches to the undisturbed forest. The sections to be measured will be spaced 1 km apart for primary roads and 0.5 km apart for secondary roads. The UTM coordinates collected from the GPS correspond to the first point of the section. Several assessment sections should be considered to characterize a single road; the number of sections to be used will depend on the length of the road.

**f) Number of dead animals:**Verify and record whether any animal has died as a result of road construction.

**g) Number of affected HCV sites:**It must be verified and recorded whether any HCV sites were affected within the assessment section. HCV sites are often important sites for wildlife (clay licks, burrows, nests, bathing sites, etc.). The number and type of affected sites must be recorded.

**h) Alteration of watercourses:**This consists of verifying whether any watercourses have been obstructed or affected in or near the section being assessed. If this is the case, the number of affected watercourses should be noted. If during the assessment, affected watercourses are found in sectors other than the assessment section, these should also be recorded in the findings section, noting the UTM coordinates of their location and describing the type of impact.

## **Processing information from road forms**

To process the road information, tables must be created in the Microsoft Excel program, which will be based on the following example:



**Chart32. Roadway width assessment.**

| Sampling points    | Main access | Secondary access |
|--------------------|-------------|------------------|
| 1                  | 6           | 5.29             |
| 2                  | 6.3         | 5                |
| 3                  | 6.2         | 4.5              |
| 4                  | 7           | 4                |
| 5                  | 7           | 5.1              |
| 6                  | 5.4         | 4.1              |
| 7                  | 5.5         | 5.2              |
| 8                  | 4.4         | 5.4              |
| 9                  | 4.7         | 4.7              |
| 10                 | 5.3         | 4.5              |
| 11                 | 5           | 4.9              |
| 12                 | 7           | 7                |
| <b>Average (m)</b> | <b>5.82</b> | <b>4.97</b>      |

From Table No. 05, the width of the roadway of the main and secondary accesses will be obtained; the result will be the average of the samples taken.

**Chart33. Evaluation of lateral clearing width.**

| Sampling points    | Main access | Secondary access |
|--------------------|-------------|------------------|
| 1                  | 1.3         | 3.15             |
| 2                  | 1           | 2.5              |
| 3                  | 0           | 1.35             |
| 4                  | 1.8         | 1                |
| 5                  | 0           | 1.5              |
| 6                  | 0           | 2                |
| 7                  | 1.7         | 1.7              |
| 8                  | 2           | 1.8              |
| 9                  | 1.5         | 2.05             |
| 10                 | 1           | 2                |
| 11                 | 2.4         | 1.5              |
| 12                 | 1.4         | 0                |
| <b>Average (m)</b> | <b>1.18</b> | <b>1.71</b>      |

The results of tables 05 and 06 multiplied by the length of the main and secondary roads respectively, will give the areas impacted by the execution of these activities.

The next step is to perform the following calculations:

**Chart34. Information processed for secondary road.**

| Topics                                                         | Values    |
|----------------------------------------------------------------|-----------|
| (A) Average road width (m)                                     | 4.97      |
| (B) Width of lateral clearing on both sides of the roadway (m) | 1.71      |
| (C) Length of opened secondary road (m)                        | 21860     |
| (D) Total width of the opened secondary road (m)               | 8.4       |
| (E) Area opened by secondary road (m <sup>2</sup> )            | 183605.78 |
| (F) Area opened by secondary road (ha)                         | 18.36     |

- Value obtained from table No. 05.
- Value obtained from table No. 06.
- This data is obtained in the field by measuring the length of the main or secondary roads built with GPS.
- Result obtained from the sum of points a + c.
- This result is the product of multiplying the points dx and e.
- It is the same value of point f converted to hectares.

For the main road, another table will be built, and the way of processing the information will be similar to table 07, using the results from tables 05 and 06.

**Chart35. Processed information for main roads.**

| Topics                                                     |
|------------------------------------------------------------|
| Average road width (m)                                     |
| Width of lateral clearing on one side only (m)             |
| Width of lateral clearing on both sides of the roadway (m) |
| Length of main access opened (m)                           |
| Total width of the main access (m)                         |
| Area opened by main access (m <sup>2</sup> )               |
| Area opened by main access (ha)                            |

#### vii. Monitoring the quality of forest road operations assessments

The person responsible for conducting field assessments will evaluate the status of monitoring of forest road operations, and must complete the assessment forms (See Annex 12.2 and 12.3). The following points will be taken into account:

##### Equipment and Materials

---

The following equipment and materials will be required for data collection:

- GPS Navigator
- Tape measure 30m
- Field notebook
- Drag Evaluation Form
- Pencil
- Duracell AA batteries

### **Qualitative evaluation**

- a) Check whether the road slope is suitable for the transit of light and heavy vehicles.
- b) Check the condition of the road to ensure rapid and safe vehicle traffic.
- c) Check whether the ditches along the main forest roads have been cleared and are not clogged.
- d) Check whether the signage directed towards transport has been installed.
- e) Check for the presence of fuel spills resulting from the operation of vehicles in transit.
- f) Check for damage: dead animals (AM), high conservation value (HCV) and alteration of watercourses (ACA)

### **Points to consider when assessing the impacts of trawling activities:**

- a) Check if the recorded UTM coordinates correspond to the initial evaluation point.
- b) Measure and verify that the correct measurements of the width of the roadway have been made.
- c) Measure and verify that the correct measurements have been made of the width of the sides.

To select the forest roads to be evaluated, a significant sample of 10% of the total segments evaluated will be taken, for which the following formula will be applied:

### **Processing information from forms.**

The processing of information resulting from the qualitative evaluation and similarities in the quality of monitoring forest road operations will be represented in percentages with respect to the effectiveness of the work performed:

Qualitative evaluations are the result of the visual inspection carried out by the evaluator, in which four ratings have been generated: Good (100%), when the operations carried out have fully complied with the standards described previously, Regular (66%), the existence of some operations that have not fully complied with the quality standards, Bad (33%), the total non-compliance with the standards but there is evidence that there was an effort to carry out the work, and Non-existent (0%), when there is no evidence of the work carried out.

The ratings include general monitoring of the activity and are based on the evaluator's criteria.

**Chart36. An example of data processing in the qualitative assessment of forest road monitoring quality.**

| Purpose of the evaluation    | Quality |         |      | Observations | Processing quality (%) |
|------------------------------|---------|---------|------|--------------|------------------------|
|                              | Bad     | Regular | Well |              |                        |
| Slope of the road            |         |         | X    |              | 100                    |
| Road conditions              |         | X       |      |              | 66                     |
| State of the ditch           |         | X       |      |              | 66                     |
| State of the signage         |         |         | X    |              | 100                    |
| Presence of fuel spillage    |         |         |      |              | 100                    |
| Affectation: AM, AVC and ACA |         |         |      |              | 100                    |
|                              |         |         |      |              | 88.66                  |

The rating for the quality of forest road monitoring in the qualitative format is 88.66%.

Similarity assessments correspond to the re-evaluation of the scale of impacts on the ecosystem. Percentage values will be generated for each assessment, representing the good or bad practices implemented.

- The georeferencing of the initial evaluation point will not be considered a percentage value; however, failure to identify the position to be evaluated will result in a final grade of 0%, since it is not possible to complete any of the subsequent evaluations.
- The permissible error range for measuring the width of the roadway for each of the evaluation points is  $\pm 7\%$ , with the score being 70% if the values are within the permissible range, and 0% if not. The percentage values should be divided equally for each point per segment evaluated.
- The permissible error range for the measurement of the width of the sides for each of the evaluation points is  $\pm 7\%$ , with a score of 30% if the values are within the permissible range, and 0% if not. Percentage values should be divided equally for each point per segment evaluated.

**Chart37.**Exemplification of data processing in the quality rating of drag monitoring in terms of similarity.

| Segment evaluated | Width of forest roads (m) |     |        |        |                |     |        |        |                |     |        |        |                |     |        |        |                |     |        |        |                |     |        |        |                |     |        |        |                |     |        |        |                |     |     |     |                |     |     |     |       |
|-------------------|---------------------------|-----|--------|--------|----------------|-----|--------|--------|----------------|-----|--------|--------|----------------|-----|--------|--------|----------------|-----|--------|--------|----------------|-----|--------|--------|----------------|-----|--------|--------|----------------|-----|--------|--------|----------------|-----|-----|-----|----------------|-----|-----|-----|-------|
|                   | P1                        |     |        |        |                |     |        |        | P2             |     |        |        |                |     |        |        | P3             |     |        |        |                |     |        |        | P4             |     |        |        |                |     |        |        | P5             |     |     |     |                |     |     |     |       |
|                   | Road width (m)            |     |        |        | Side width (m) |     |        |        | Road width (m) |     |        |        | Side width (m) |     |        |        | Road width (m) |     |        |        | Side width (m) |     |        |        | Road width (m) |     |        |        | Side width (m) |     |        |        | Road width (m) |     |     |     | Side width (m) |     |     |     |       |
|                   | MT                        | EV  | EP (-) | EP (+) | MT             | EV  | EP (-) | EP (+) | MT             | EV  | EP (-) | EP (+) | MT             | EV  | EP (-) | EP (+) | MT             | EV  | EP (-) | EP (+) | MT             | EV  | EP (-) | EP (+) | MT             | EV  | EP (-) | EP (+) | MT             | EV  | EP (-) | EP (+) |                |     |     |     |                |     |     |     |       |
| 1                 | 7                         | 7   | 6.5    | 7.5    | 11             | 11  | 10     | 12     | 7.4            | 7.5 | 6.9    | 7.9    | 15             | 15  | 14     | 16     | 7              | 8   | 6.5    | 7.5    | 7.9            | 8   | 7.3    | 8.5    | 6.9            | 7   | 6.4    | 7.4    | 11             | 10  | 9.9    | 11     | 6.4            | 6   | 6   | 6.8 | 7.8            | 8   | 7.3 | 8.3 |       |
| 2                 | 4                         | 4.1 | 3.7    | 4.3    | 6.4            | 7   | 6      | 6.8    | 4              | 3.9 | 3.7    | 4.3    | 10             | 10  | 9.3    | 11     | 5              | 5.1 | 4.7    | 5.4    | 7              | 7   | 6.5    | 7.5    | 5              | 5   | 4.7    | 5.4    | 7.5            | 7.5 | 7      | 8      | 4.9            | 5   | 4.6 | 5.2 | 5.5            | 5.8 | 5.1 | 5.9 |       |
| 3                 | 5.1                       | 6   | 4.7    | 5.5    | 7.6            | 8.2 | 7.1    | 8.1    | 5.1            | 5.1 | 4.7    | 5.5    | 6.8            | 6.8 | 6.3    | 7.3    | 5.1            | 4.9 | 4.7    | 5.5    | 8.9            | 9.2 | 8.3    | 9.5    | 5.1            | 5.1 | 4.7    | 5.5    | 6.9            | 7   | 6.4    | 7.4    | 5.5            | 5.9 | 5.1 | 5.9 | 8.3            | 8.6 | 7.7 | 8.9 |       |
| 4                 | 5                         | 4.8 | 4.7    | 5.4    | 6              | 5.9 | 5.6    | 6.4    | 5              | 5   | 4.7    | 5.4    | 6.5            | 6.6 | 6      | 7      | 5.1            | 4.9 | 4.7    | 5.5    | 6.2            | 6.5 | 5.8    | 6.6    | 5.5            | 6   | 5.1    | 5.9    | 7.9            | 7.3 | 7.3    | 8.5    | 5.1            | 5.1 | 4.7 | 5.5 | 6.1            | 6.1 | 5.7 | 6.5 |       |
| No.               | P1                        |     |        |        |                |     |        |        | P2             |     |        |        |                |     |        |        | P3             |     |        |        |                |     |        |        | P4             |     |        |        |                |     |        |        | P5             |     |     |     |                |     |     |     | Total |
| 1                 | 14                        |     |        |        | 6              |     |        |        | 14             |     |        |        | 6              |     |        |        | 0              |     |        |        | 6              |     |        |        | 14             |     |        |        | 6              |     |        |        | 14             |     |     |     | 6              |     |     |     | 86.5  |
| 2                 | 14                        |     |        |        | 0              |     |        |        | 14             |     |        |        | 6              |     |        |        | 14             |     |        |        | 6              |     |        |        | 14             |     |        |        | 6              |     |        |        | 14             |     |     |     | 6              |     |     |     | 94    |
| 3                 | 0                         |     |        |        | 0              |     |        |        | 14             |     |        |        | 6              |     |        |        | 14             |     |        |        | 6              |     |        |        | 14             |     |        |        | 6              |     |        |        | 14             |     |     |     | 6              |     |     |     | 80    |
| 4                 | 14                        |     |        |        | 6              |     |        |        | 14             |     |        |        | 6              |     |        |        | 14             |     |        |        | 6              |     |        |        | 0              |     |        |        | 6              |     |        |        | 14             |     |     |     | 6              |     |     |     | 86.5  |
|                   |                           |     |        |        |                |     |        |        |                |     |        |        |                |     |        |        |                |     |        |        |                |     |        |        |                |     |        |        |                |     | 86.5   |        |                |     |     |     |                |     |     |     |       |

MT: Logging Monitoring; EV: Logging Monitoring Evaluation; EP: Permissible Error;

Within the permissible range; Outside the permissible range

The rating for the quality of logging monitoring in the similarity format is 86.5%.

For both evaluations (qualitative and similarity) percentage values will be assigned, which correspond as follows: Qualitative evaluation 15% and Similarity evaluation 85%, this is represented by the importance that each of them has in the evaluations of forest road monitoring.

**Chart38.** Exemplification of the processing of the results of the quality and similarity assessments of drag monitoring.

| Concept                | Evaluation weight (%) | Resulting value (%) | Total (%) |
|------------------------|-----------------------|---------------------|-----------|
| Qualitative evaluation | 15                    | 83                  | 12.45     |
| Similarity assessment  | 85                    | 86.5                | 73.52     |
|                        |                       |                     | 85.97     |

Finally, the final result will be evaluated according to the effectiveness indicators established by Mejía (2018), which establish that a percentage >91% corresponds to the Very effective rating, a percentage between 81-90% corresponds to Moderately effective and 80% or less corresponds to Ineffective, presenting ranges of ineffectiveness from level 0 (very ineffective) to level 3 (slightly ineffective) where the following ranges are included: 61-80% (level 3), 41-60% (level 2), 21-40% (level 1) and 0-20% (level 0).

The final result is 85.97%, corresponding to the quality monitoring of operations, which is classified as Moderately Effective. Repeat the procedure for all monthly evaluations and calculate the average.

The frequency with which the evaluation will be carried out will depend on the monitoring activity, which is carried out annually in the final stages of forest road operations where a better-represented sample is obtained.

## 6.5 BRIDGES

The bridge evaluation must be completed 100%, avoiding sampling and data extrapolation, except in cases of force majeure, which may occur due to weather, accessibility, or limited resources allocated for monitoring. The evaluator must complete the evaluation form for said operation (See Annex 13). The following evaluation methodology will be used:

### Points to consider for bridge evaluation.

- The logs, if possible, should come from nearby locations.
- Avoid obstructing the normal flow of water.
- There must be proper management of waste, fuels and lubricants.
- Permanent use of personal protective equipment (PPE), transporters must wear the following:
  - Helmet
  - Steel-toed boots or shoes

**Note:** Each carrier must have a 2-4 kg PQS fire extinguisher

### Equipment and Materials

The following equipment and materials will be required for data collection:

- GPS Navigator
- Winch of 10 meters or more
- Field notebook
- Bridge Evaluation Form
- Pencil
- Duracell AA batteries

### Evaluation methodology

The information required to be collected in the Bridge Evaluation Form is as follows:

- a) Name of the bridge:** Bridge name assigned by forestry management personnel.
- b) UTM coordinates:** Collect the coordinates using a GPS navigator and position yourself in the center of the bridge.
- c) Qualitative evaluation:** Qualitatively evaluate the following aspects as good, fair, or poor: the occurrence of fuel or lubricant spills, watercourse flow, the quality of the logs used, the use of suitable species, complementary materials (palm leaves, intermediate rods, and soil used) for the construction of the bridge, and the entrance and exit slope.
- d) Bridge width:** The width (m) of the constructed bridge must be recorded, the measurement of which is between 7 and 8m.
- e) Number of dead animals:** Verify and record whether any animal has died as a result of the construction of the bridge.
- f) Number of affected HCV sites:** It must be verified and recorded whether any HCV sites were affected by bridge construction. HCV sites are often important sites for wildlife (clay licks, burrows, nests, bathing sites, etc.). The number and type of sites affected must be recorded.

### Processing information from forms.

Microsoft Excel will be used to process the information collected during the bridge assessment, and calculation tables will be created with this program.

## 6.6 SEWERS

The sewer assessment must be completed 100%, avoiding sampling and data extrapolation, except in cases of force majeure, which may occur due to weather conditions, accessibility, or limited resources allocated for monitoring. The evaluator must complete the evaluation form for said operation (See Annex 14). The following evaluation methodology will be used:

### Points to consider for sewer assessment.

- a) The logs, if possible, should come from nearby locations.
- b) Avoid obstructing the normal flow of water.
- c) There must be proper management of waste, fuels and lubricants.
- d) Permanent use of personal protective equipment (PPE), transporters must wear the following:
  - Helmet
  - Steel-toed boots or shoes

**Note:** Each carrier must have a 2-4 kg PQS fire extinguisher

### Equipment and Materials

The following equipment and materials will be required for data collection:

- GPS Navigator
- Winch of 10 meters or more
- Field notebook
- Bridge Evaluation Form
- Pencil
- Duracell AA batteries

### Evaluation methodology

The information required to be collected in the Sewer Assessment Form is as follows:

- a) Sewer No.:** Sewer number assigned by forestry management personnel.
- b) UTM coordinates:** Collect the coordinates using a GPS navigator and position yourself in the center of the bridge.
- c) Qualitative evaluation:** Qualitatively evaluate the following aspects as good, fair, or poor: the occurrence of fuel or lubricant spills, entry and exit from the watercourse, and the quality of the logs used.
- d) Number of dead animals:** Verify and record whether any animal has died as a result of the construction of the bridge.
- e) Number of affected HCV sites:** It must be verified and recorded whether any HCV sites were affected by bridge construction. HCV sites are often important sites for wildlife (clay licks, burrows, nests, bathing sites, etc.). The number and type of sites affected must be recorded.



### **Processing information from forms.**

Microsoft Excel will be used to process the information collected during the sewer assessment, and calculation tables will be created with this program.

## **9. ANNEXES**

# **FORMS FOR MONITORING AND EVALUATION OF FORESTRY OPERATIONS**

## Annex 1.1: Permanent Monitoring Plots

## FORMATO DE EVALUACIÓN Y MONITOREO DE PPM

**Concesión/UMF:**

**PPM:**

**Parcela de Corta:**

**Responsable:**

**Nº sub-parcela:**

**Fecha:**

**Empresa Operadora :**

| Objeto de la evaluación                     | Calidad |         |       | Observaciones |
|---------------------------------------------|---------|---------|-------|---------------|
|                                             | Malo    | Regular | Bueno |               |
| Demarcación de las sub-parcelas (fustales)  |         |         |       |               |
| Demarcación de las sub-parcelas (latizales) |         |         |       |               |
| Demarcación de las sub-parcelas (brinzales) |         |         |       |               |
| Estado y plaqueado de los vértices          |         |         |       |               |
| Área de amortiguamiento                     |         |         |       |               |
| Codificación de los individuos              |         |         |       |               |
| Ubicación de árboles en las sub-parcelas    |         |         |       |               |

| Hallazgos                                                        | Acciones Correctivas Implementadas                               |
|------------------------------------------------------------------|------------------------------------------------------------------|
| <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> | <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> | <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> | <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> | <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> | <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |

## FORMATO DE EVALUACIÓN Y MONITOREO DE PPM

**Fecha:**84

## Annex 2.1: Natural Regeneration

## FORMATO DE EVALUACIÓN Y MONITOREO DE RN

**Concesión/UMF:**

**N° Faja:**

**Parcela de Corta:**

**Responsable:**

**Kilómetros recorridos:**

**Fecha:**

**Empresa Operadora :**

| Objeto de la evaluación                 | Calidad |         |       | Observaciones |
|-----------------------------------------|---------|---------|-------|---------------|
|                                         | Malo    | Regular | Bueno |               |
| Limitación de la faja (fustales)        |         |         |       |               |
| Limitación de la faja (latizales)       |         |         |       |               |
| Limitación de la faja (brinzales)       |         |         |       |               |
| Estado cinta de fajas de inicio y final |         |         |       |               |
| Caracterización de la zona              |         |         |       |               |

[illegible]

## Annex 2.2: Natural Regeneration

## FORMATO DE EVALUACIÓN Y MONITOREO DE RN

**Concesión/UMF:**

**N° Faja:**

**Parcela de Corta:**

**Responsable:**

**Kilómetros recorridos:**

**Fecha:**

**Empresa Operadora :**

[illegible]

## Annex 3.1: Plot Trees



## FORMATO DE EVALUACIÓN Y MONITOREO DE AP

**Concesión/UMF:**

**Parcela de Corta:**

**Responsable:****Fecha:**

**Empresa Operadora :**

| Objeto de la evaluación            | Calidad |         |       | Observaciones |
|------------------------------------|---------|---------|-------|---------------|
|                                    | Malo    | Regular | Bueno |               |
| Limpieza del árbol previa medición |         |         |       |               |
| Marca del Dap/Punto de medición    |         |         |       |               |
| Cambio del punto de medición       |         |         |       |               |
| Codificación de los árboles        |         |         |       |               |

[illegible]

## Annex 3.2: Plot Trees

**Concesión/UMF:**

**Responsable:**

**Empresa Operadora :**

**Parcela de Corta:**

**Fecha:**

[illegible]



## Annex 4: Conservation Area



## FORMATO DE EVALUACIÓN Y MONITOREO DE AC Y LINDEROS

**Concesión/UMF:**

**AC/PC:**

**Responsable:**

**Fecha:**

**Empresa Operadora :**

| Objeto de la evaluación   | Calidad |         |       | Observaciones |
|---------------------------|---------|---------|-------|---------------|
|                           | Malo    | Regular | Bueno |               |
| Estado de los límites     |         |         |       |               |
| Estado de los vértices    |         |         |       |               |
| Estado de la señalización |         |         |       |               |

[illegible]

## Annex 5: High Conservation Value

## FORMATO DE EVALUACIÓN Y MONITOREO DE AVC

**Concesión/UMF:**

**Parcela de Corta:**

**Responsable:****Fecha:**

**Empresa Operadora :**

[illegible]

| Hallazgos                                                   | Acciones Correctivas Implementadas                          |
|-------------------------------------------------------------|-------------------------------------------------------------|
| .....<br>.....<br>.....<br>.....<br>.....<br>.....<br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>.....<br>..... |
| .....<br>.....<br>.....<br>.....<br>.....<br>.....<br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>.....<br>..... |
| .....<br>.....<br>.....<br>.....<br>.....<br>.....<br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>.....<br>..... |

## Annex 6: Camps

| <b>FORMATO DE EVALUACIÓN Y MONITOREO DEL CAMPAMENTOS</b>                     |                                    |                   |       |                                |
|------------------------------------------------------------------------------|------------------------------------|-------------------|-------|--------------------------------|
| <b>Maderacre</b><br><small>Cuidando el medio ambiente desde la raíz.</small> |                                    |                   |       |                                |
| <b>Concesión/UMF:</b>                                                        |                                    | <b>PC:</b>        |       |                                |
| <b>Responsable:</b>                                                          |                                    | <b>Operación:</b> |       |                                |
| <b>Empresa Operadora :</b>                                                   |                                    | <b>Fecha:</b>     |       |                                |
| Objeto de la evaluación                                                      | Calidad                            |                   |       | Observaciones                  |
|                                                                              | Malo                               | Regular           | Bueno |                                |
| Área del campamento en función al número de ambientes o personal             |                                    |                   |       | A1=    ; A2=    ; L1=    ; L2= |
| Distribución del campamento                                                  |                                    |                   |       |                                |
| Pendiente del terreno                                                        |                                    |                   |       |                                |
| Drenaje del terreno                                                          |                                    |                   |       |                                |
| <b>Estado de los ambientes:</b>                                              |                                    |                   |       |                                |
| Cocina                                                                       |                                    |                   |       |                                |
| Dormitorios                                                                  |                                    |                   |       |                                |
| Área de trabajo (Oficina)                                                    |                                    |                   |       |                                |
| Almacén de equipos                                                           |                                    |                   |       |                                |
| Almacén de combustibles                                                      |                                    |                   |       |                                |
| Duchas                                                                       |                                    |                   |       |                                |
| Letrinas                                                                     |                                    |                   |       |                                |
| Pozo de residuo                                                              |                                    |                   |       |                                |
| Estado de la fuente de agua                                                  |                                    |                   |       |                                |
| Estado del sistema eléctrico                                                 |                                    |                   |       |                                |
| Cantidad y estado de los extintores                                          |                                    |                   |       |                                |
| Almacenamiento de los alimentos                                              |                                    |                   |       |                                |
| Uso de Cal viva / Creso                                                      |                                    |                   |       |                                |
| Separación de residuos                                                       |                                    |                   |       |                                |
| Gestión de pilas                                                             |                                    |                   |       |                                |
| Estado de Baterías                                                           |                                    |                   |       |                                |
| Estado de Radio de Comunicación                                              |                                    |                   |       |                                |
| Señalización                                                                 |                                    |                   |       |                                |
| Otros:                                                                       |                                    |                   |       |                                |
|                                                                              |                                    |                   |       |                                |
|                                                                              |                                    |                   |       |                                |
| Hallazgos                                                                    | Acciones Correctivas Implementadas |                   |       |                                |
|                                                                              |                                    |                   |       |                                |
|                                                                              |                                    |                   |       |                                |
|                                                                              |                                    |                   |       |                                |

## Annex 7: Surveillance Posts

## FORMATO DE EVALUACIÓN Y MONITOREO DE PUESTOS DE VIGILANCIA

**Concesión/UMF:**

**PC:**

**Responsable:**

**PV:**

**Empresa Operadora :**

**Fecha:**

| Objeto de la evaluación                                                                |  | Calidad |         |       | Observaciones |
|----------------------------------------------------------------------------------------|--|---------|---------|-------|---------------|
|                                                                                        |  | Malo    | Regular | Bueno |               |
| EVALUACIÓN DE LA INFRAESTRUCTURA                                                       |  |         |         |       |               |
| Conservación de la infraestructura                                                     |  |         |         |       |               |
| Pendiente del terreno                                                                  |  |         |         |       |               |
| Drenaje del terreno                                                                    |  |         |         |       |               |
| Estado de los ambientes:                                                               |  |         |         |       |               |
| Cocina                                                                                 |  |         |         |       |               |
| Dormitorios                                                                            |  |         |         |       |               |
| Almacén de equipos                                                                     |  |         |         |       |               |
| Almacén de combustibles                                                                |  |         |         |       |               |
| Duchas                                                                                 |  |         |         |       |               |
| Letrinas                                                                               |  |         |         |       |               |
| Pozo de residuo                                                                        |  |         |         |       |               |
| Estado de la fuente de agua                                                            |  |         |         |       |               |
| Estado de los desagües                                                                 |  |         |         |       |               |
| Estado del sistema eléctrico                                                           |  |         |         |       |               |
| Cantidad y estado de los extintores                                                    |  |         |         |       |               |
| Almacenamiento de los alimentos                                                        |  |         |         |       |               |
| Uso de Cal viva / Creso                                                                |  |         |         |       |               |
| Separación de residuos                                                                 |  |         |         |       |               |
| Gestión de pilas                                                                       |  |         |         |       |               |
| Estado de Baterías                                                                     |  |         |         |       |               |
| Estado de Radio de Comunicación                                                        |  |         |         |       |               |
| Señalización                                                                           |  |         |         |       |               |
| EVALUACIÓN DEL FUNCIONAMIENTO                                                          |  |         |         |       |               |
| Verificar el archivo de autorizaciones para el ingreso a las concesiones.              |  |         |         |       |               |
| Verificar el correcto uso del cuaderno de registros de ingresos y salidas.             |  |         |         |       |               |
| Verificar si hay registros de decomisos de especímenes de flora y fauna no autorizada. |  |         |         |       |               |

[illegible]

## Annex 8.1: Forest Census



### FORMATO DE EVALUACIÓN Y MONITOREO DE CENSO FORESTAL COMERCIAL

Concesión/UMF: \_\_\_\_\_

Parcela de Corta: \_\_\_\_\_

Fecha: \_\_\_\_\_

Responsable: \_\_\_\_\_

Empresa Operadora Responsable de la Actividad: \_\_\_\_\_

| N° | Brig. | Coordenadas UTM |       | Evaluación comparativa |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
|----|-------|-----------------|-------|------------------------|-------|---------|-------|-------|-------|----------------|-------|-------------------|-------|---------------|-------|-------|-------|-----------------------------|----|--|--|-----------|-------|
|    |       |                 |       | Código árbol           |       | Especie |       | D/C*  |       | Medida D/C (m) |       | Altura Aprov. (m) |       | Calidad Fuste |       | Obs.  |       | Tratamiento silvicultural** |    |  |  | Semillero |       |
|    |       | Este            | Norte | Censo                  | Eval. | Censo   | Eval. | Censo | Eval. | Censo          | Eval. | Censo             | Eval. | Censo         | Eval. | Censo | Eval. | L                           | NL |  |  | Censo     | Eval. |
| 1  |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 2  |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 3  |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 4  |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 5  |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 6  |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 7  |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 8  |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 9  |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 10 |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 11 |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 12 |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 13 |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 14 |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 15 |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 16 |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 17 |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 18 |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 19 |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |
| 20 |       |                 |       |                        |       |         |       |       |       |                |       |                   |       |               |       |       |       |                             |    |  |  |           |       |

\*D= Diámetro, C= Circunferencia

\*\*L=Corta de lianas realizado, NL=Corta de lianas no realizado

| Hallazgos | Acciones correctivas |
|-----------|----------------------|
|           |                      |

## Annex 8.2: Forest Census

## FORMATO DE EVALUACIÓN Y MONITOREO DEL CENSO FORESTAL

**Concesión/UMF:**

**PC:**

**Responsable:****Fecha:**

**Empresa Operadora :**

**N° árboles evaluados:**

| Objeto de la evaluación                      | Calidad |         |       | Observaciones |
|----------------------------------------------|---------|---------|-------|---------------|
|                                              | Malo    | Regular | Bueno |               |
| Ancho y dirección de trochas aperturadas     |         |         |       |               |
| Presencia de la cinta en vértice             |         |         |       |               |
| Información de la cinta en vértice           |         |         |       |               |
| Jalones en vértices                          |         |         |       |               |
| Codificación de los árboles y sus semilleros |         |         |       |               |
| Árboles sin censar                           |         |         |       |               |
| AVC sin georeferenciar                       |         |         |       |               |
| Vértices e hitos de la PC y el CMRA          |         |         |       |               |

[illegible]

## Annex 9.1: Logging



## FORMATO DE EVALUACIÓN Y MONITOREO DE TALA

Concesión/UMF:\_\_\_\_\_

Parcela de Corta:\_\_\_\_\_

**Fecha:**\_\_\_\_\_

**Responsable:**

**Empresa Operadora Responsable de la Actividad:**

[illegible]

\*VE=Vía de escape, CM=Corte mesa, CB=Corte bisagra, DC=Dirección de caída, D=Despunte (Los campos evaluados serán evaluados: B=Bueno, R=Regular, M=Malo)

\*\*Apr=Árbol aprovechable >10cm, Sem=Árbol semillero, AFC=Árbol futura cosecha, AM=Animales muertos, AVC=Atributos de alto valor de conservación, ACA=Alteración de cursos de agua

| Hallazgos | Acciones correctivas |
|-----------|----------------------|
|           |                      |

## Annex 9.2: Quality of Logging Monitoring



**Parcela de Corta:**

**Fecha:**

**Empresa Operadora :**

[illegible]



### Annex 9.3: Quality of Logging Monitoring

## FORMATO DE EVALUACIÓN DE LA CALIDAD DEL MONITOREO DE TALA

**Concesión/UMF:**

**Parcela de Corta:**

**Responsable:****Fecha:**

**Empresa Operadora :**

| Objeto de la evaluación                   | Calidad |         |       | Observaciones |
|-------------------------------------------|---------|---------|-------|---------------|
|                                           | Malo    | Regular | Bueno |               |
| Orientación de las vías de escape         |         |         |       |               |
| Técnica adecuada de tala (mesa o bizagra) |         |         |       |               |
| Orientación de caída                      |         |         |       |               |
| Técnica de despunte                       |         |         |       |               |
| Afectación: AM, AVC y ACA                 |         |         |       |               |

[illegible]



**Maderacre**

Concesión/UMF: \_\_\_\_\_ Parcela de Corta: \_\_\_\_\_ N° sub parcela: \_\_\_\_\_ Fecha: \_\_\_\_\_  
 Longitud de vial de arrastre (km): \_\_\_\_\_ Empresa Operadora Responsable de la Actividad: \_\_\_\_\_  
 Responsable: \_\_\_\_\_

[illegible]

\*\*P=Punto de muestreo, AM=Animales muertos, AVC=Atributos de alto valor de conservación

**Nota:** En las viales de arrastre se muestrearán 05 puntos continuos separados entre si por 10m, tomándose las coordenadas UTM en el primer punto de muestreo (P1). Dependiendo de la longitud de la vial dentro de la parcela se pueden considerar varios tramos de evaluación para una misma vial.

| Hallazgos | Acciones correctivas |
|-----------|----------------------|
|           |                      |

## Annex 10.2: Quality of Drag Monitoring



**Empresa Operadora:**

**Fecha:**[illegible]

### Annex 10.3: Quality of Drag Monitoring

## FORMATO DE EVALUACIÓN DE LA CALIDAD DEL MONITOREO DE ARRASTRE



**Concesión/UMF:**

**Parcela de Corta:**

**Responsable:****Fecha:**

**Empresa Operadora :**

| Objeto de la evaluación              | Calidad |         |       | Observaciones |
|--------------------------------------|---------|---------|-------|---------------|
|                                      | Malo    | Regular | Bueno |               |
| Calidad del ancho de la vía          |         |         |       |               |
| Presencia de derrames de combustible |         |         |       |               |
| Presencia de vías paralelas          |         |         |       |               |
| Afectación: AM, AVC y ACA            |         |         |       |               |

[illegible]

## Annex 11.1: Storage yards



## FORMATO DE EVALUACIÓN Y MONITOREO DE PATIOS DE ACOPIO

Concesión/UMF: \_\_\_\_\_

Parcela de Corte: \_\_\_\_\_

**Fecha:** \_\_\_\_\_

**Responsable:**

**Empresa Operadora Responsable de la Actividad:**

[illegible]

\*Los campos evaluados serán evaluados: B=Bueno, R=Regular, M=Malo

\*\*AIFP=Área impactada fuera del patio, AUP=Área utilizada del patio, AM=Animales muertos, AVC=alteración de alto valor de conservación, ACA=alteración de cursos de agua

Codificación de trozas= CMRA, PC correspondiente, N° del árbol, división del fuste (A, B, C, D)

Orden=ubicación de trozas de manera paralela y agrupada en pilas distribuidas por grupos en función a la Concesión, la PC de procedencia y a nivel de especies.

AVC= Prohibido la construcción de patios a menos de 25m de BAVC; ACA= Los patios de acopio no deben ubicarse a menos de 50m de cursos y/o cuerpos de agua.

| Hallazgos | Acciones correctivas |
|-----------|----------------------|
|           |                      |

## Annex 11.2: Quality of monitoring of storage yards

## FORMATO DE EVALUACIÓN DE LA CALIDAD DEL MONITOREO DEL PATIO DE ACOPIO

**Concesión/UMF:**

**Parcela de Corta:**

**Empresa Operadora:****Responsable:****Fecha:**[illegible]

### Annex 11.3: Quality of monitoring of storage yards



### **FORMATO DE EVALUACIÓN DE LA CALIDAD DEL MONITOREO DE PATIO DE ACOPIO**

**Concesión/UMF:**

**Parcela de Corta:**

**Responsable:****Fecha:**

**Empresa Operadora :**

| Objeto de la evaluación                       | Calidad |         |       | Observaciones |
|-----------------------------------------------|---------|---------|-------|---------------|
|                                               | Malo    | Regular | Bueno |               |
| Presencia de derrame de combustible           |         |         |       |               |
| Manejo de residuos                            |         |         |       |               |
| Adecuado drenaje del patio                    |         |         |       |               |
| Pendiente suave para la acumulación de trozas |         |         |       |               |
| Codificación de trozas                        |         |         |       |               |
| Orden de las trozas                           |         |         |       |               |
| Afectación: AM, AVC y ACA                     |         |         |       |               |

| Hallazgos                                                       | Acciones Correctivas Implementadas                              |
|-----------------------------------------------------------------|-----------------------------------------------------------------|
| .....<br>.....<br>.....<br>.....<br>.....<br>.....<br><br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>.....<br><br>..... |
| .....<br>.....<br>.....<br>.....<br>.....<br>.....<br><br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>.....<br><br>..... |
| .....<br>.....<br>.....<br>.....<br>.....<br>.....<br><br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>.....<br><br>..... |
| .....<br>.....<br>.....<br>.....<br>.....<br>.....<br><br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>.....<br><br>..... |
| .....<br>.....<br>.....<br>.....<br>.....<br>.....<br><br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>.....<br><br>..... |

## Annex 12.1: Roads



## FORMATO DE EVALUACIÓN Y MONITOREO DE CAMINOS

Concesión/UMF:

Parcela de Corta:

**Fecha:** \_\_\_\_\_

**Responsable:**

**Empresa Operadora Responsable de la Actividad:**

[illegible]

\*P=Pendiente, EV=Estado de vía, EC=Estado de cuneta, ES=Estado de señalización, DC=Derrame de combustibles (Los campos evaluados serán evaluados: B=Bueno, R=Regular, M=Malo)

\*AC=Ancho de calzada, AL=Ancho de los laterales, AM=Animales muertos, AVC=Atributos de alto valor de conservación, ACA=Alteración de cursos de agua

Nota: Se muestreará 05 puntos continuos separados cada 20m entre si, tomándose las coordenadas en el primer punto de muestreo (Punto 1). La separación de tramos se dará cad 1km para caminos primarios y 0.5km para secundarios.

| Hallazgos | Acciones correctivas |
|-----------|----------------------|
|           |                      |



## Annex 12.2: Road Monitoring Quality

**Concesión/UMF:**

**Parcela de Corta:**

**Empresa Operadora:****Responsable:****Fecha:**[illegible]



## FORMATO DE EVALUACIÓN DE LA CALIDAD DEL MONITOREO DE CAMINOS



| Hallazgos                                          | Acciones Correctivas Implementadas                 |
|----------------------------------------------------|----------------------------------------------------|
| .....<br>.....<br>.....<br>.....<br>.....<br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>..... |
| .....<br>.....<br>.....<br>.....<br>.....<br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>..... |
| .....<br>.....<br>.....<br>.....<br>.....<br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>..... |
| .....<br>.....<br>.....<br>.....<br>.....<br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>..... |
| .....<br>.....<br>.....<br>.....<br>.....<br>..... | .....<br>.....<br>.....<br>.....<br>.....<br>..... |

## Annex 13: Bridges



## FORMATO DE EVALUACIÓN Y MONITOREO DE PUENTES

**Concesión/UMF:**\_\_\_\_\_

Parcela de Corta:\_\_\_\_\_

**Fecha:**\_\_\_\_\_

**Responsable:**

**Empresa Operadora Responsable de la Actividad:**

[illegible]

\*Los campos evaluados serán evaluados: B=Bueno, R=Regular, M=Malo

\*\*AM=Animales muertos, AVC=alteración de alto valor de conservación

| Hallazgos | Acciones correctivas |
|-----------|----------------------|
|           |                      |

## Annex 14: Sewers



### FORMATO DE EVALUACIÓN Y MONITOREO DE ALCANTARILLAS

Concesión/UMF: \_\_\_\_\_

Parcela de Corta: \_\_\_\_\_

Responsable: \_\_\_\_\_

Fecha: \_\_\_\_\_

Empresa Operadora Responsable de la Actividad: \_\_\_\_\_

| N°<br>Alcantarilla | Coordenadas UTM |       | EVALUACIÓN CUALITATIVA* |     |                   |    |     |
|--------------------|-----------------|-------|-------------------------|-----|-------------------|----|-----|
|                    | Este            | Norte | Derrame de combustible  | EYS | Calidad de trozas | AM | AVC |
|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |
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|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |
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|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |
|                    |                 |       |                         |     |                   |    |     |

\*EYS=Entrada y salida del curso de agua (Los campos evaluados serán evaluados: B=Bueno, R=Regular, M=Malo)

\*\*AM=Animales muertos, AVC=alteración de alto valor de conservación

| Hallazgos | Acciones correctivas |
|-----------|----------------------|
|           |                      |