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II. INTRODUCTION

This document outlines the rules and procedures for buffer credit contributions applicable to FCO project activities. Buffer credits are a risk management tool used to account for potential non-permanence of carbon sequestration due to unintentional reversals[1] such as fire, pest outbreaks, illegal logging, or changes in land tenure and management.

The buffer pool functions as a shared insurance mechanism to ensure environmental integrity and safeguard the permanence of credited emission reductions.

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IV. LIST OF EQUATIONS

[1] Virgilio, N. and S. Marshall. 2009. Forest Carbon Strategies in Climate Change Mitigation: Confronting Challenges Through Onthe-Ground Experience, The Nature Conservancy. Arlington, Virginia. Accessed from: (Virgilio)

1. Reversal Risk Categories

The risk of carbon stock reversals is inherent in land-based mitigation activities. To uphold the environmental integrity and permanence of Forest Carbon Offset (FCO) projects, all verified emission reductions and removals are subject to a buffer contribution. This contribution percentage of the net Forest Carbon Units (FCUs) issued and is withheld in a centralized or scheme-level FCO Buffer Account.

The required buffer contribution is determined using the **FCO Buffer Risk Assessment Tool**, a standardized framework that evaluates project-specific conditions across key risk categories. This tool enables project proponents to identify potential sources of non-permanence and quantify the extent of required credit set-aside. The buffer is designed to serve as a risk insurance mechanism, allowing the FCO Program to compensate for future reversals without invalidating previously issued credits.

Where state-level buffer rules or contributions exist, they must be adhered to. In the absence of such rules, the national FCO Buffer Guideline shall apply. Table 1 outlines the six (6) reversal risk categories that form the foundation of the assessment tool.

Table 1: Risk Categories for Reversal Risks Assessment

Risk Category	Risk Description and Applicability
Financial Risk	The risk of project discontinuity due to financial insolvency or limited credit worthiness of the Project Proponent.
Social and Political Risk	Risk that sociopolitical instability, weak governance, or poor stakeholder engagement undermines project continuity or reverses carbon benefits.
Illegal Logging Risk	Risk of unplanned deforestation or forest degradation due to illicit timber harvesting or encroachment.
Wildfire Risk	Risk of carbon stock loss due to uncontrolled wildfires, influenced by regional conditions, fuel loads, and fire preparedness.
Biotic Risk	Risk of carbon loss due to pest outbreaks, disease, or other biotic disturbances.
Hydrological/Flooding Risk	Risk of carbon reversal caused by flooding, prolonged waterlogging, or hydrological disruptions, especially for wetlands or flood-prone forested areas.

Each risk category includes a clearly defined quantification method, typically calculated using default values or standardized equations, as well as options for evidence-based, project-specific risk reduction. These risk ratings collectively determine the required percentage of Forest Carbon Units (FCUs) to be deposited in the FCO Buffer Account.

2. Risk Analysis and Buffer Determination

This section outlines the technical approach for quantifying non-permanence risk for each FCO project or scheme and determining the required buffer contribution.

The risk assessment applies to all project types under the FCO program, including Single Projects (SPs), Grouped Projects (GPs) and Jurisdictional Programs of Activities (JPoAs) as defined in the Subsidiary Guidelines on Project Requirement.

Each project must complete the Buffer Risk Assessment Tool as part of its validation. The resulting risk determines the applicable buffer percentage, which is deducted at issuance and deposited into either an individual or group buffer account, depending on the project structure, as further detailed in the next section.

The risk assessment is carried out in two steps:

- Step 1: Risk Analysis and Quantification
- Step 2: Overall Non-Permanence and Buffer Determination

2.1 Step 1: Risk Analysis and Quantification

Each of the six (6) risk categories defined in Section 1 is assessed individually using the FCO Buffer risk Assessment Tool. Project Proponents may choose between applying conservative default values or using justified, verifiable, project-specific data sources where permitted.

2.1.1 Risk Category: Financial Risk

Financial Risk is calculated based on a registered business credit score (0 - 100 scale), obtained from a certified credit reporting agency. The financial risk score is determined using the following equation:

Equation 1: Financial Risk Buffer Determination

$$\text{Financial Risk} = \left(\left[1 - \left(\frac{Credit\ Score - Min}{Max - Min}\right)\right] \times 8.31\%\right) + 3.76\%$$

Where:

Variable	Description	Unit
$\boldsymbol{Min}$	The minimum score defined by the credit reporting agency	-
$\boldsymbol{Max}$	The maximum score defined by the credit reporting agency	-

If a project cannot provide a valid credit score, the default risk value of 12.1% is applied. Maximum allowable score in this category is capped at 12.1%.

2.1.2 Risk Category: Social and Political Risk

This category uses the World Bank's Worldwide Governance Indicators (WGI)[2] dataset. The average of the six governance indicators (Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption) is computed and inserted into the following equation:

Equation 2: Social and Political Risk Buffer Determination

$$\text{Social and Political Risk} = \left(1 - \left[\frac{Average\ WGI + 2.5}{5}\right]\right) \times 8\%$$

The maximum potential contribution for this risk is 8%. Values must be derived from the most recent WGI dataset available at the time of verification.

2.1.3 Risk Category: Illegal Logging Risk

This risk is determined using Malaysia's ILAT (Illegal Logging and Associated Trade) Risk Score[3] as published in Forest Trends' latest dataset[4]. The illegal logging risk score is determined using the following equation:

Equation 3: Illegal Logging Risk Buffer Determination

$$\text{Illegal Logging Risk} = \left(\frac{ILAT\ Score}{100}\right) \times Financial\ Risk\ \times 0.5$$

Maximum possible score for this category is 4.25%, reflecting half the upper bound of the financial risk.

2.1.4 Risk Category: Wildfire Risk

For forest projects, Project Proponents may either:

a) Use regional default values:
   - Low risk: 5%
   - Moderate risk: 7%
   - High risk: 11%

b) Reduce the above values by 25% with verifiable, implemented fire mitigation measures, supported by credible documentation.

The wildfire risk score is calculated using the equation below:

Equation 4: Forest Project's Risk Buffer Determination

$$\text{Wildfire Risk} = Regional\ Risk\ Value\ \times\ (1 - Mitigation\ Adjustment)$$

Wetland and grassland projects may use default values of 2% and 3% respectively or propose project-specific assessments.

[2] https://www.worldbank.org/en/publication/worldwide-governance-indicators

[3] As of the most recent ILAT publication (dated August 2021) at time of writing, ILAT risk score for Malaysia is 60.19.

[4] Forest Trends. 2022. "ILAT Risk Homepage." Forest Trends. Available at: https://www.forest-trends.org/idat/ilat-risk-data-tool/

2.1.5 Risk Category: Biotic Risk

Default biotic risk is 8%, and it may be halved if the project includes standing deadwood in its carbon pool. The biotic risk score is determined using the following equation:

Equation 5: Biotic Risk Buffer Determination

$$\text{Biotic Risk} = 8\% \times (1 - Deadwood\ Inclusion\ Adjustment)$$

- Deadwood Included: Adjustment = 0.5
- Deadwood Excluded: Adjustment = 0

2.1.6 Risk Category: Hydrological/Flooding Risk

Default risk values based on project attributes:

a) Wetland: 5%
b) Forest project with ≥60% wetlands: 5%
c) Forest project with <60% wetlands: 0%

Projects may reduce risk by 50% if they demonstrate the presence of flood-tolerant species using forest inventory data and scientifically justified flood tolerance literature.

2.2 Step 2: Overall Non-Permanence Risk Rating and Buffer Determination

After quantifying each category above, the total buffer requirement is calculated as the sum of all individual risk contributions:

Equation 6: Buffer Pool Contribution

$$\text{Total Buffer Contribution (\%)} = Financial\ Risk + Social\ and\ Political\ Risk + Illegal\ Logging\ Risk + Wildfire\ Risk + Biotic\ Risk + Hydrological\ Risk$$

Each risk category contributes a defined percentage to the overall buffer contribution based on project-specific data, default values, or third-party datasets as outlined in the corresponding subsections. Risk scores must be calculated using the most recent, validated, and independently verifiable information available at the time of validation or verification.

Minimum and Maximum Contribution Constraints

The total buffer percentage must meet or exceed the minimum threshold of 10%, irrespective of calculated risk values. Projects that implement high-risk mitigation measures may reduce their buffer contribution, but no project may fall below this minimum. Conversely, if the aggregate score exceeds 30%, the project shall be classified as high risk and shall be deemed ineligible for crediting until the Project Proponent demonstrates adequate risk mitigation measures to reduce the buffer requirement below the 30% cap.

Buffer Account Allocation

Once the buffer contribution percentage is determined, it must be applied to the verified net FCUs generated by the project to calculate the total volume of FCUs that must be contributed to the FCO Buffer System. The allocation of these FCUs to the appropriate buffer account shall depend on the project structure:

- For Single Projects (SPs), the buffer contribution shall be deposited into an Individual Buffer Account specific to that project, tracked under MFF registry.
- For Grouped Projects (GPs) and Jurisdictional Programs of Activities (JPoAs), the cumulative buffer contribution from all component sites must be deposited into a centralized Scheme-Level Group Buffer Account, governed and administered in accordance with Section 3 of this Guideline.

Each project proponent must declare the intended buffer account type in its Project Design Document and confirm the appropriate account structure at the time of validation. Contributions must be fully accounted for before issuance of any tradable FCUs.

Applicability and Future Revisions

The buffer percentage calculated under this section shall be re-evaluated on annual basis throughout the entire crediting and permanence period. This ensures that buffer contributions continue to reflect the project's updated risk profile. In addition to the scheduled annual reassessment, any material changes in project ownership, design, governance, regional disturbance factors, or applicable legal frameworks shall trigger a mandatory reassessment of the buffer contribution. In such cases, buffer contributions may be adjusted upwards during subsequent verification events, in accordance with Section 3.5 on Buffer Top-Up Requirements.

3. Individual and Group Buffer Pool Structures

To safeguard the environmental integrity of all issued FCUs against non-permanence, MFF allows for **two complementary buffer pool structures**. These structures are designed to accommodate the diversity of project types under the FCO program, namely SPs, GPs, and JPoAs. This section outlines the rules, roles, and requirements governing each buffer structure and their integration into the MFF Registry

3.1 Individual Buffer Accounts

Each Single Project is required to deposit buffer credits into an Individual Buffer Account. This account is managed within the MFF Registry and must hold the total buffer contribution as determined by the project's risk assessment. The buffer credits in this account serve as collateral to insure against any reversal events affecting the project and are managed in accordance with the monitoring and verification obligations set out in this Tool. All credits deposited into the individual account remain locked for the full permanence period unless released or cancelled under reversal or retirement provisions.

In the event of a verified reversal, the buffer credits from that project are cancelled to compensate for the loss. If the available buffer balance is insufficient to cover the full reversal volume, the project proponent is legally responsible for replenishing the shortfall or retiring equivalent credits within a defined compliance period.

Key requirements for individual buffer accounts:

a) Buffer contribution must be calculated based on the total non-permanence risk score from Section 2.
b) Contributions are withheld at issuance and tracked separately from tradeable FCUs.
c) Reversal events are monitored at the project level. If confirmed, the equivalent number of buffer credits will be cancelled from the project's individual account
d) Projects are liable for top-up obligations if their buffer account becomes depleted.

Individual buffer accounts ensure that each SP bears full responsibility for managing its own reversal risks, independent of other projects in the program.

3.2 Scheme-Level Group Buffer Accounts

Scheme-level buffer accounts are designed for projects that are either structured as Grouped Projects (GPs) or Jurisdictional Programs of Activities (JPoAs), where multiple project sites are managed under a unified buffer account administered by a single scheme owner. This structure enables more efficient administration, promotes collective risk management, and reduces transaction costs associated with maintain multiple individual buffer accounts.

Each project site within the grouped structure must independently apply the buffer risk assessment to determine its specific buffer contribution based on project-level risks. The buffer percentage calculated for each site is then applied to its verified net Forest Carbon Units (FCUs), and the aggregate contributions from the total group buffer.

MFF Registry maintains oversight and tracking of all scheme-level buffer accounts and enforces the conditions governing their use, including buffer entry, exit, and adjustments.

3.2.1 Grouped Project Buffer

For GPs, the total scheme-level buffer contribution is the sum of the buffer obligations of all participating project sites, as determined by their respective risk ratings. The buffer obligations are recalculated annually or when a project joins or exits the group.

The buffer account must be updated to reflect any addition or removal of project sites. Where there is a change in scheme ownership, the buffer contributions must be re-evaluated for that year, and any upward or downward adjustments must be applied based on revised risk assessments. The buffer assessments must also be updated annually, ensuring that risks remain adequately covered throughout the crediting and permanence periods.

3.2.2 Jurisdictional Program Buffer

JPoAs may be managed by state authorities or other jurisdictional entities acting as the Project Owner. These programs are structured to consolidate carbon crediting efforts across a defined jurisdiction, typically a state or administrative region. The jurisdictional entity must manage a dedicated scheme-level buffer account to address risks arising from all included project sites.

The jurisdictional entity may determine additional internal rules for buffer contributions, such as a minimum number of participating project sites, standardised mitigation criteria, or harmonised timelines for risk assessments across sites. However, all contributions must be derived from risk-based calculations in the earlier section of the methodology and submitted to MFF for tracking and compliance.

The formula for calculating the scheme-level group buffer contribution is as follows:

Equation 7: Scheme-level Grouped Buffer Contribution Determination

$$\text{Grouped Buffer (t)} = \sum_{i=1}^{N} ER_i \times R_i$$

Where:

Variable	Description	Unit
Grouped Buffer (t)	Total buffer contribution for all grouped project sites in year t	%

Variable	Description	Unit
$\boldsymbol{ER_i}$	Total net GHG emission reductions or removals for project i	t CO_2e
$\boldsymbol{R_i}$	Buffer contribution rate determined for project i using the FCO Buffer Risk Assessment Tool	%
$\boldsymbol{N}$	Number of participating projects within the Grouped Project or JPoA	-

Contributions under both GPs and JPoAs must be maintained in segregated scheme-level buffer accounts within MFF Registry. These buffers must not be used to compensate for reversals in external schemes or projects not affiliated with the group or jurisdictional program. If a project exists the scheme, the associated buffer allocation must be adjusted in accordance with Section 3.5.

3.3 Buffer Registry Integration

All buffer contributions whether from individual projects or scheme-level group accounts, shall be recorded, tracked, and managed within MFF Registry. The registry ensures transparency and traceability of contributions, ownership, and reversals throughout the crediting and permanence periods.

Each buffer account will be tagged to its respective projects or grouped scheme and will reflect:
a) The initial buffer contributions based on risk scoring;
b) Any adjustments due to annual reassessment, ownership changes, or project events;
c) Credits cancelled due to verified reversals; and
d) Top-ups, replenishments, or reallocation transactions.

Project Proponents must ensure their registry accounts are current and consistent with their project documentation. Scheme owners managing grouped or jurisdictional programs must maintain records for each participating site or activity to ensure accountability at the scheme level. The registry will generate annual buffer reports for each account and serve as the official record for verification and audit purposes.

3.4 Reversal Monitoring, Triggers and Reporting Requirements

To safeguard the environmental integrity of the FCO Program, project proponents are required to monitor, detect, and report any reversal events that result in the release of GHG emissions from the credited carbon stock.

A reversal event is defined as any unintentional or intentional occurrence that leads to the loss of credited carbon, including but not limited to:
a) Wildfires, floods, pests, disease or other natural disturbances;
b) Illegal logging, encroachment, or sabotage;
c) Project non-compliance or voluntary project withdrawal;
d) Land use changes or failures in implementation and monitoring.

Project proponents must submit a Reversal Report to MFF within 30 working days of becoming aware of a potential reversal. The report must include the nature of the event, affected carbon pools, estimated emissions loss, and supporting evidence. MFF may also initiate reversal investigations if it becomes aware of credible indications from third-party sources, satellite monitoring, or verification body notifications.

MFF shall assign a designated verification body to assess the magnitude of the reversal and recommend the volume of buffer credits to be cancelled in accordance with the methodology. The cancellation is executed through MFF Registry, and the project proponent is notified on the final determination.

3.5 Buffer Top-Up Requirements and Adjustment Mechanisms

If a verified reversal exceeds the balance of a project's individual buffer account or a scheme-level buffer account, the project proponent or scheme owner shall be required to tup up the deficit to restore the program's integrity.

Top up obligations may arise under the following scenarios:
a) Reversal volume exceeds the available buffer balance;
b) Annual risk assessment results in an increased buffer requirement;
c) A project exits a grouped scheme, requiring isolation and reallocation of buffer obligations;
d) A new project is added to a scheme and must contribute its applicable buffer share

3.5.1 Replenishment Obligation in Case of Reversal Deficit

The replenishment volume is calculated as:

Equation 8: Buffer Top Up in the Case of Reversal

$$\text{Top up volume} = V_{Reversed} - B_{Available}$$

Where:

Variable	Description	Unit
Top up volume	The amount of FCUs to be contributed	FCU
$= \boldsymbol{V_{Reversed}}$	Verified Reversals Volume	t CO_2e
$\boldsymbol{B_{Available}}$	Available Buffer Balance	FCU

Top up must be made within 90 days of final determination and can be fulfilled through additional buffer contribution from future issuance or cancellation of tradeable FCUs held by the project or scheme owner.

3.5.2 Top up Requirement for Project Exit from Grouped Schemes

When a project exits a grouped scheme, the corresponding buffer share must be retained or reallocated. The required buffer reallocation is computed as:

Equation 9: Top-up Requirement for Project Exiting from Grouped Scheme

$$\text{ETU} = \left(P_{Total} - P_{Verified}\right) \text{ x R}$$

Where:

Variable	Description	Unit
ETU	Buffer top up required upon project exit	FCU
$\boldsymbol{P_{Total}}$	Project's total projected emissions reductions/removals for the entire crediting period	t CO_2e

Variable	Description	Unit
$P_{Verified}$	Verified emissions reductions/removals to date	t CO_2e
R	Buffer risk percentage	%

3.5.3 Entry contributions from New Projects into an Existing Grouped Scheme

Only projects with identical crediting periods and permanence durations may be added to an existing grouped scheme. Entry is allowed during a defined onboarding windo established at scheme registration. New projects joining an eligible grouped scheme must contribute to the scheme-level buffer account based on their assessed buffer percentage. The entry buffer contribution is calculated as:

Equation 10: Buffer Contribution for New Projects Entering Existing Grouped Scheme

Entry Contribution = E x R

Where:

Variable	Description	Unit
Entry Contribution	Required buffer contribution upon project entry	FCU
E	Net emission reductions of the new project	t CO_2e
R	Buffer risk percentage determined in Section 2	%

Projects failing to meet the grouping conditions must be registered independently as single projects or under a separate grouped scheme.

4. References

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