



PRINTRELEASE STANDARD
PRX-STD-V02.9-INTL



TITLE: PrintReleaf Standard

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SCOPE: International

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CONTACT: Jordan K. Darragh CEO / PrintReleaf, Inc.
www.printreleaf.com

EMAIL: info@printreleaf.com

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PrintReleaf, Inc. has developed a patented software platform - PrintReleaf Exchange (PRX) - which calculates and equates: a) media consumption to forest impact measured in standard trees and b) media consumption to carbon emitted measured in metric tonnes or kilograms. Customers of PrintReleaf offset their forest impact and/or carbon emissions through Verified Reforestation projects or Verified Carbon Offset projects based on the requirements of the PrintReleaf Standard.



Overview

The PrintReleaf Standard was originally developed through cooperation of PrintReleaf, Inc. (PrintReleaf), non-profit, non-government reforestation organizations which are partners of PrintReleaf, the University of Colorado – Masters of the Environment Program, and SGS North America, Inc.

Use of the PrintReleaf Standard

This standard outlines the minimum requirements by PrintReleaf's network of certified Global Reforestation Partners and their Projects and Carbon Offset Projects certified by [VERRA](#) or [ACR](#).

The purpose of this standard is to uphold the integrity of the PrintReleaf Exchange [PRX] and ensure the quantitative volume of trees planted and/or carbon emissions offset is accurate and truthful.

The requirements are divided into the following sections:

Section 1 describes the PrintReleaf Exchange scope and calculation methodology

Section 2 describes the general requirements for Global Reforestation Partners to achieve and maintain PrintReleaf Certification

Please send any comments about the PrintReleaf Standard to:

PrintReleaf, Inc.
4845 Pearl East Cir Ste 118 PMB 752848
Boulder, Colorado 80301-6112 US

Email: info@printreleaf.com

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Section 1: Overall Scope and Calculation Methodology

1 Scope

Biomass (paper) Offsets: The PrintReleaf Exchange (PRX) is the world’s first known technology platform connecting consumers of paper-based (fiber-based) products with global reforestation projects to certifiably reforest their paper consumption and achieve a ‘net-neutral’, if not ‘net-positive’, balance. Customers reforest their consumption by planting new trees (biomass offsets) – equivalent to their consumption – across projects managed by PrintReleaf’s network of certified Global Reforestation Partners. As a result, customers effectively achieve a net-neutral or net-positive balance and contributions are accelerated to the reforestation projects that are replanting what has been lost from the world’s original forest canopy. Customers are certified by PrintReleaf that their consumption will be reforested.

Carbon Offsets: The PrintReleaf Exchange (PRX) may also measure the carbon footprint of the paper or media produced and consumed by a customer either through their fleet of printers typically as part of a Managed Print Services (MPS) contract or as part of a Commercial Graphic Print (CGP) transaction or order. Through PRX, the carbon footprint may be offset through issuance of Carbon Offsets issued in metric tonnes (MT) or kilograms (kg) certifying a carbon-neutral outcome for the paper produced and consumed.

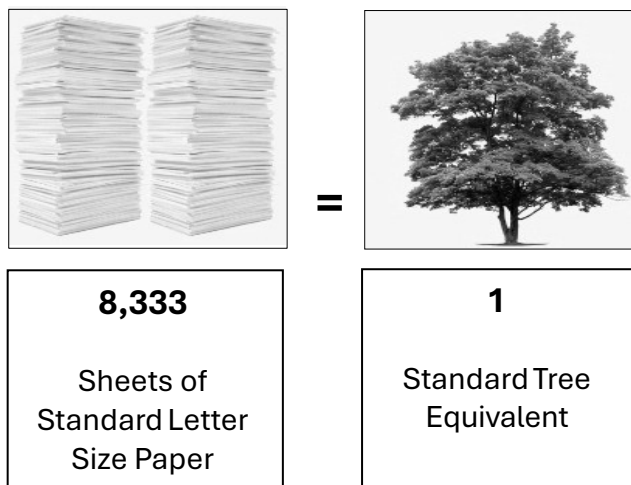
All carbon offsets issued through PRX are sourced and backed from widely recognized and accepted Standards and Registries including VERRA (Verified Carbon Standard) and the ACR (American Carbon Registry).

PrintReleaf’s Authorized Account ID for VERRA is: 3069

PrintReleaf’s Authorized Account ID for ACR is: 1244

2 PRX Calculation Methodology

Biomass Offsets: PRX employs a calculation methodology for biomass offsets published and employed by the Environment Paper Network (EPN)¹ and is considered a ‘best estimate’ in synchronization with their Paper Calculator tool. The EPN Paper Calculator is widely accepted as the most accurate tool for determining and equating weighted paper volume to standard trees along with other environmental attributes. Their core equation is:



PRX collects paper consumption data from print monitoring software applications, print estimating software, or online marketplace systems to determine and normalize the number of sheets of paper. The paper consumption data may contain details specific to paper size and density. When this is the case, PRX will automatically calculate the equivalent number of standard sheets of paper (8.5 × 11 inch size, 20lb stock), pounds or kilograms. Additionally, PRX may collect paper consumption data in the form of business cards, hard copy books, or other paper-based products. Regardless of form, PRX will always mathematically normalize consumption to standard sheets before equating consumption to standard tree equivalents. A standard tree equivalent is a tree which will mature to be 40 feet high by 7 inches wide diameter at breast height (DBH). When processing paper consumption data, if the paper size and/or density data is absent, PRX will default the paper size and/or density calculation to standard sheet paper size and density values.

¹Environmental Paper Network (environmentalpaper.org)



Below is an example transaction calculation based on the following paper consumption data:

1,450,000 sheets of tabloid size 11" x 17" 100# text stock

Variable Paper Data

Quantity: 1,450,000

Width: 0.2794 m (11")

Height: 0.4318 m (17") Density: 150 g/m²

PRX normalizes the variable paper data to standard sheet units as such:

$$(1,450,000 \times 0.2794 \text{ m} \times 0.4318 \text{ m} \times 150 \text{ g/m}^2) / (0.2159 \text{ m} \times 0.2794 \text{ m} \times 75 \text{ g/m}^2) = \mathbf{5,800,000 \text{ standard sheets}}$$

Upon normalizing and representing paper consumption data in standard sheets, PRX will equate the data to a number of standard tree equivalents:

$$(5,800,000 / 8,333) = 696.023 \text{ standard tree equivalents}$$

Example Calculation 1:

Faidherbia Albida tree with an average height of 65 feet and average diameter of 24 inches at maturity

Variable Tree Data

Height: 19.812 m (65')

Diameter: 0.6096 m (24")

PRX normalizes the variable tree data to standard tree equivalents using a cylindrical volumetric calculation:

$$(\pi \times (0.6096 \text{ m} / 2)^2 \times 19.812 \text{ m}) / (\pi \times (0.1778 \text{ m} / 2)^2 \times 12.192 \text{ m}) = \mathbf{19.102 \text{ standard tree equivalents}}$$

To complete the conversion in the above example and equate **1,450,000 sheets of tabloid size 11x17", 100# stock to an equal number of mature Faidherbia Albida trees**, the formula and resulting amount is:

$$((1,450,000 \times 0.2794 \text{ m} \times 0.4318 \text{ m} \times 150 \text{ g/m}^2) / (0.2159 \text{ m} \times 0.2794 \text{ m} \times 75 \text{ g/m}^2) / 8333) / ((\pi \times (0.6096 \text{ m} / 2)^2 \times 19.812 \text{ m}) / (\pi \times (0.1778 \text{ m} / 2)^2 \times 12.192 \text{ m})) = \mathbf{36.437 \text{ Faidherbia Albida trees}}$$



Example Calculation 2:

Lagerstroemia indica tree with an average height of 14 feet and average width of 4 inches at maturity

Variable Tree Data

Height: 4.2672 m (14')

Diameter: 0.1016 m (4")

PRX will normalize the variable tree data to standard tree equivalents using a cylindrical volumetric calculation:

$(\pi * (0.1016 \text{ m} / 2)^2 * 4.2672 \text{ m}) / (\pi * (0.1778 \text{ m} / 2)^2 * 12.192 \text{ m}) = \mathbf{0.114 \text{ standard tree equivalents}}$

To complete the conversion in the above example and equate **1,450,000 sheets of tabloid size 11" x**

17", 100# text stock to an equal number of mature Lagerstroemia indica trees, the formula and resulting amount is:

$((1,450,000 * 0.2794 \text{ m} * 0.4318 \text{ m} * 150 \text{ g/m}^2) / (0.2159 \text{ m} * 0.2794 \text{ m} * 75 \text{ g/m}^2) / 8333) / ((\pi * (0.1016 \text{ m} / 2)^2 * 4.2672 \text{ m}) / (\pi * (0.1778 \text{ m} / 2)^2 * 12.192 \text{ m})) = \mathbf{6,090.244 \text{ Lagerstroemia indica trees}}$

Carbon Offsets: PRX employs multiple Life Cycle Assessments (LCAs) for carbon offsets. The default LCA is published by the [American Forest & Paper Association \(AF&PA\)](#). Alternatively, customers may select the LCA published by the [Environmental Paper Network's \(EPN\)](#) paper calculator.

PRX first normalizes the paper consumption data into sheets, pounds (lb), or kilograms (kg), then multiply the preferred unit of measure by the emission factor for metric tonnes of carbon dioxide equivalent (MTCO_{2e}) per the selected LCA.

The AF&PA LCA calculation is: 117,648 standard sheets = 1 MTCO_{2e}

The EPN LCA calculation is: 24,597 standard sheets = 1 MTCO_{2e}



Example Calculation:

875,250 sheets of 28" x 40" 130# gloss coated cover stock

Variable Paper Data

Quantity: 875,250

Width: 0.7112 m (28")

Height: 1.016 m (40") Density: 350 g/m²

AF&PA LCA Constants

Coated Freesheet: 281273.927852761 grams paper per MTCO_{2e}

Step 1: Calculate Paper Mass

$$(875,250 \times 0.7112 \text{ m} \times 1.016 \text{ m} \times 350 \text{ g/m}^2) = 221,353,105.68 \text{ g}$$

Step 2: Equate Emissions

$$221,353,105.68 \text{ g} \div 281273.927852761 \text{ g/MTCO}_{2e} = 786.966312 \text{ MTCO}_{2e}$$

3 Original Effective Date

November 12, 2012

4 References

The following information sources were referenced in formulating the PrintReleaf Standard:

- FSC Standard for Chain of Custody Certification: FSC-STD-40-004 V2-1 EN
- Recycled Papers: The Essential Guide (Cambridge, MA: MIT Press, 1992)
- USDA Forest Service Manual: FSM 2400, Chapter 2470 – Silvicultural Practices

5 Terms and Definitions

For this standard the following terms and definitions apply to this document:

Carbon Offset: an action intended to compensate for the emission of carbon dioxide into the atmosphere as a result of industrial or other human activity, especially when quantified and traded as part of a commercial program

Certifying Body (CB): an independent organization responsible of issuing a formal recognition (such as a certificate) proving that the certification meets specific standard requirements.

GIS: stands for Global Information System which is a system of hardware and software used for storage, retrieval, mapping, and analysis of geographic data.

GPS: stands for Global Positioning System which is a satellite-based system for identifying a location on the earth based on latitudinal and longitudinal coordinates.

Indigenous: originating in and characteristic of a particular region or country; native.

MTCO_{2e}: a standard unit of measure equaling one metric tonne of carbon dioxide equivalent.

Naturalized: to introduce (organisms) into a region and cause them to flourish as if native.

Normalize: to convert variable data to a standard set of dimensions, e.g., converting paper size and stock to a consistent standard sheet equivalent; or to convert tree size to a consistent standard tree equivalent - average height of 40 feet and average diameter of 7 inches.

Nursery: refers to a place where trees are grown to a usable or transportable size, e.g., growing a seed into a seedling.

Paper Density: a unit of measure used in the pulp and paper industry to denote the mass of the product per unit of area for a type of paper. Paper density is expressed in grams per square meter (g/m^2 , commonly 'GSM').

Net-Neutral: refers to a position of balance when an equal number of standard tree equivalents have been planted equal to a normalized amount of paper consumption.

PRX: PRX stands for PrintReleaf Exchange – the software platform developed by PrintReleaf, Inc. connecting electronic print monitoring software or online marketplace systems with eligible global reforestation projects for purposes of measuring and offsetting consumption.

Silviculture: refers to the care and cultivation of forest trees.

Standard Sheet: a standard unit of measure equivalent to one uncoated freesheet of paper with a width of 0.2159 meters (8.5”), height of 0.2794 meters (11”), and a density of $75 \text{ g}/\text{m}^2$.

Standard Tree Equivalent (STE): a standard unit of measure equivalent to one tree with a mature height of 12.192 meters (40') and diameter (DBH) of 0.1778 meters (7”) – softwood or hardwood.

Verbal Forms of Expression used within the PRX Standard

Should: must or ought, past tense of shall – indicates the most suitable possibility out of multiple possibilities with regard to requirements within the standard

May: express of possibility – indicates permission within the limits of the standard

Can: to be able to know how to – used in statements within the standard to define possibility and capability

Shall: must or obliged to – indicates strict requirements to adhere to within the standard

SECTION 2: Global Reforestation Partners – Requirements

6 Organizational Requirements

6.1 Tenure and Reputation

- 6.1.1 The organization shall have an established history as a legal entity that is equal to or greater than three years or have experience in the region they are reforesting for at least 12 months.
- 6.1.2 The organization shall not have any illegal convictions brought against them in their past history.

6.2 Reforestation Expertise

- 6.2.1 The organization shall have a history of three or more years of dedicated reforestation efforts and expertise.
- 6.2.2 The organization shall have a public facing presence visible via marketing communications (web, print, etc.) which documents their ability to deliver satisfactory reforestation.

6.3 Financial

- 6.3.1 The organization shall have one or more of the following:
 - a. total net assets of \$100,000 or more
 - b. maintain cash balances of \$100,000 or more as of their last audited fiscal year
 - c. total cash revenues of \$200,000 or more per year for the last two fiscal years

6.4 Field Operations

- 6.4.1 The organization shall have a dedicated Field Operations Manager (or similar title) for each of their reforestation projects participating in connection with PrintReleaf. The Field Operations Manager shall maintain a regular presence at the physical site of the project. A regular presence is defined as 60% or more of their working hours.
- 6.4.2 The organization shall have a dedicated Compliance Manager (or similar title) responsible for organizational adherence to the PrintReleaf Standard. This person is responsible for ensuring the Global Reforestation Partner is complying with all of the Organizational Requirements of the PrintReleaf Standard, not just Field Operations.
- 6.4.3 The organization is responsible for building staff awareness subject to the PrintReleaf Standard.
- 6.4.4 The organization confirms that they do not wrongfully employ children or support slave labor in any of their reforestation projects.

6.5 Training

- 6.5.1 The organization is responsible for training their direct staff across all titles and responsibilities for those individuals responsible for meeting the requirements of the PrintReleaf Standard.
- 6.5.2 The organization is responsible for training their indirect staff as an extension of their field operations for all projects participating in connection with PrintReleaf.

6.6 Documentation and Management

- 6.6.1 The organization is responsible for keeping timely records and providing quarterly progress reports upon request for each project participating with PrintReleaf. Requested quarterly progress reports will include updates to inform on 1) sources and uses of funds 2) seedling acquisition and nursery development progress 3) quantitative tree planting by species and 3) a general narrative outlining development status both backward and forward looking.
- 6.6.2 The organization is responsible for keeping timely records and shall keep PrintReleaf informed of any expected changes relative to their ongoing ability to meet the minimum requirements of the PrintReleaf standard.
- 6.6.3 The organization shall provide legal evidence of their right to land entry with legal 'in country' authority to plant trees.
- 6.6.4 The organization shall provide legal evidence of their right to access land to plant trees.
- 6.6.5 The organization confirms that the land use to plant the trees required by PrintReleaf will remain protected from the time the trees are planted until growth, at minimum, full maturity (which may vary by species and location).
- 6.6.6 The organization is responsible for providing online content, i.e., video, photography, written content, and statistics on a minimum interval of every 365 days or annual calendar year.
- 6.6.7 Specific to statistics, while organizations are subject to the PRX audit process, the organization shall update available forest capacity for each participating project on a minimum interval of every 365 days or annual calendar year.
- 6.6.8 Upon receipt of contributed funds from PrintReleaf, the organization shall ensure the corresponding volume of trees and specified tree species be planted in the ground (no longer residing in a nursery) within 365 standard calendar days (one year).
- 6.6.9 Should the organization determine they cannot meet the timing requirement for a specific transaction or set of transactions they shall have the right to re-queue transactions and plant trees at another project location so long as the project is managed by the same parent organization and the correct number of standard tree equivalents are re-queued and planted.

7 Project Specifications

7.1 Logistics & Parameters

- 7.1.1 The organization is responsible for providing and maintaining the tree species content visible in PRX associated with each eligible reforestation project participating in PRX.
- 7.1.2 The organization is responsible for providing the percentage of PrintReleaf species planted within a project site among additional different species planted within the same project site.
- 7.1.3 The organization is responsible for providing a digital boundary (e.g., KMZ boundary) for the project site area.
- 7.1.4 The organization is responsible for declaring if there is a specific dedicated PrintReleaf plot area within the overall project site area. If applicable, the organization is responsible for providing a specific digital boundary for the PrintReleaf dedicated site.
- 7.1.5 The organization is responsible for providing accurate GPS coordinates for the location of the project site area.
- 7.1.6 As in section 7.1.4, the organization is responsible for declaring if there is a specific dedicated PrintReleaf plot area within the overall project site area. If applicable, the organization is responsible for providing specific GPS coordinates for the PrintReleaf dedicated site.
- 7.1.7 The organization is responsible for providing the expected mature height and diameter (DBH) of the tree species for each eligible reforestation project participating in PRX to allow for Standard Tree Equivalent normalization calculations.

8 Project Field Audit Process & Requirements

8.1 Field Audit Process

PrintReleaf's audit methodologies will either employ the Circle Plot Method, Drone Audit Method, Virtual Field Audit method, or Technology-Enabled Method. The decision to use one method rather than the other will be at the discretion of PrintReleaf.

8.1.1 Circle Plot Method

In-person field audits will be completed via third party auditors. The corresponding desk audit will be conducted by Certifying Bodies. Field auditors will conduct surveys at each reforestation site by utilizing the circle plot method to survey and analyze the forest density, tree survivorship, and total inventory for PrintReleaf reforestation projects. Each audit will be conducted according to the site-specific requirements detailed by PrintReleaf. Upon completion of the field analysis, data gathered will be verified by a Certifying Body. Any corrective action requests will be addressed on a project- by-project basis to ensure compliance with the PrintReleaf Standard.

8.1.2 Drone Audit Method

The drone audit method will consist of a data collection phase, data analysis phase, and final verification by a Certifying Bod. Data collection will be conducted by a licensed and PrintReleaf approved drone operator at the reforestation project site. For data collection the drone operator will fly their drone over the project site and take images that will later be georectified. For data analysis the imagery will be uploaded into a spatial analysis program (e.g. ArcGIS or QGIS) to determine forest density, tree survivorship, and total inventory. Finally, the raw data, georectified image, and post analysis imagery and results, will be verified by a Certifying Body. Any corrective action requests will be addressed on a project- by-project basis to ensure compliance with the PrintReleaf Standard.

8.1.3 Drone Operator Standard Requirements

- Must possess a valid and up to date FAA Part 107 license
- Must possess a drone no heavier than 55 lbs with photography capabilities
- Must be familiar with PrintReleaf Standard

8.1.4 **Virtual Field Audit Method**

Virtual field audits will be completed via third parties. The virtual field audit verification and corresponding desk audit will be conducted by a Certifying Body. Virtual field auditors will collect reforestation data from each project site including forest density, tree survivorship, any photographic or video evidence available, and total inventory for the PrintReleaf reforestation project zone. Data gathered will be analyzed by a Certifying Body to determine the performance of the project. Any corrective action requests will be addressed on a project- by-project basis to ensure compliance with the PrintReleaf Standard.

8.1.5 **Technology-Enabled Audit Method**

Technology-enabled field audits will be conducted through the use of technology such as on-premise cameras and remote sensing technology such as dendrometers which enable ground-level visibility, monitoring and measurement of the quantitative forest data required by PrintReleaf. The technology-enabled field audit will serve in place of or complimentary to other PrintReleaf field or desk audit methodologies. Any corrective action requests will be addressed on a project- by-project basis to ensure compliance with the PrintReleaf Standard.

8.1.6 **Reporting for Smaller Scale or ‘End of Project’ Audits**

Similar to SFI and PEFC practices, in the case where the remaining capacity to be audited is deemed minimal, e.g., when a large scale project is mostly planted and audited, but the remaining unaudited trees still need to be audited, then the organization may self-report by providing field audit documentation detailing the quantity of trees being audited and the number that did not survive. Reports must include data including quantities and species as well as any available photo and videographic evidence. PrintReleaf still retains the right to eventually organize an independent field audit. All self-reported audits will still be subject to a verifiable review by a Certifying Body to ensure compliance with the PrintReleaf Standard.

8.2 **Field Performance Requirements**

8.2.1 The organization is responsible for planting the tree species corresponding to each transaction associated with contributions to their projects, i.e., the project cannot substitute tree species because it would risk disqualifying the accuracy of the standard tree equivalent required to meet the paper consumption data for the transaction.

- 8.2.2 The organization is responsible for planting standard tree equivalents specific to the quantities and species prescribed by each transaction derived from PRX.
- 8.2.3 The organization is responsible for tending to commonly accepted silvicultural restoration practices to include planting non-invasive species relative to the location of each project.
- 8.2.4 Reforestation projects will be audited, at minimum, within 8 years after the first contribution. A project may be audited more than once before the 8 year mark but no more than 8 years after the first contribution. A final audit will be performed within 8 years after the final contribution.
- 8.2.5 The organization is responsible for upholding the PrintReleaf warranty which guarantees 100% net-survival. Any shortfall of 100% net-survival will require corrective action to fulfill the shortfall within a reasonable amount of time as determined by PrintReleaf and the verifying Certifying Body where applicable.
- 8.2.6 After each audit, should a Certifying Body determine that survival is less than 100%, then the organization is responsible for planting the required number of standard tree equivalents at their cost as determined by the auditor to meet the minimum standards of the PRX warranty guarantee within one year of being notified by the auditor. Failure to meet this requirement may result in decertification from PrintReleaf. Alternatively, especially in the common case where planting operations have ceased or the reforestation project land has reached capacity, PrintReleaf may certify warranty replacement trees by retiring standard tree equivalents in an alternate project as insurance against survival that is less than 100% or assigning warranty replacement trees to a certificate from an alternate project and/or accepting the shortfall by reducing the inventory of expected trees for a specific project.
- 8.2.7 The only factor which would release a project from meeting 100% survival is an 'Act of God', i.e., an event that directly and exclusively results from the occurrence of natural causes that could not have been prevented by the exercise of foresight or caution; an inevitable accident.